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RESOURCE CONSERVATION AND RECOVERY ACT FACILITY INVESTIGATION REPORT  
ADDENDUM AREA OF CONCERN 583 (AOC 583) ZONE E CNC CHARLESTON SC  
8/19/2002  
CH2M HILL

# RFI REPORT ADDENDUM

## Area of Concern 583. Zone E



***Charleston Naval Complex  
North Charleston, South Carolina***

SUBMITTED TO  
***U.S. Navy Southern Division  
Naval Facilities Engineering Command***

*CH2M Jones*

*August 2002*

*Contract N62467-99-C-0960*



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August 19, 2002

Mr. David Scaturo  
South Carolina Department of Health and  
Environmental Control  
Bureau of Land and Waste Management  
2600 Bull Street  
Columbia, SC 29201

Re: RFI Report Addendum (Revision 0) – AOC 583, Zone E

Dear Mr. Scaturo:

Enclosed please find four copies of the RFI Report Addendum (Revision 0) for AOC 583 in Zone E of the Charleston Naval Complex (CNC). This report has been prepared pursuant to agreements by the CNC BRAC Cleanup Team for completing the RCRA Corrective Action process.

The principal author of this document is Jim Edens. Please do not hesitate to contact him at 352/335-5877, extension 2491, should you have any questions or comments.

Sincerely,

CH2M HILL

Dean Williamson, P.E.

cc: Rob Harrell/Navy, w/att  
Gary Foster/CH2M HILL, w/att

# RFI REPORT ADDENDUM

## Area of Concern 583, Zone E



***Charleston Naval Complex  
North Charleston, South Carolina***

SUBMITTED TO  
***U.S. Navy Southern Division  
Naval Facilities Engineering Command***

PREPARED BY  
***CH2M-Jones***

***August 2002***


Revision 0  
Contract N62467-99-C-0960  
158814.ZE.PR.01

**Certification Page for RFI Report Addendum (Revision 0) –  
AOC 583, Zone E**

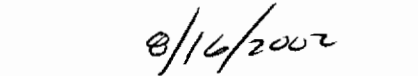
I, Dean Williamson, certify that this report has been prepared under my direct supervision.  
The data and information are, to the best of my knowledge, accurate and correct, and the  
report has been prepared in accordance with current standards of practice for engineering.

South Carolina

P.E. No. 21428



Dean Williamson, P.E.



Date

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# 1 Acronyms and Abbreviations

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|    |                         |                                      |
|----|-------------------------|--------------------------------------|
| 2  | AOC                     | Area of concern                      |
| 3  | AST                     | Aboveground storage tank             |
| 4  | BCT                     | BRAC Cleanup Team                    |
| 5  | BEQ                     | Benzo[a]pyrene equivalent            |
| 6  | BRAC                    | Base Realignment and Closure Act     |
| 7  | BRC                     | Background reference concentration   |
| 8  | CA                      | Corrective action                    |
| 9  | CMS                     | Corrective measures study            |
| 10 | CNC                     | Charleston Naval Complex             |
| 11 | COC                     | Chemical of concern                  |
| 12 | COPC                    | Chemical of potential concern        |
| 13 | CSI                     | Corrective Study Investigation       |
| 14 | DAF                     | Dilution attenuation factor          |
| 15 | EnSafe                  | EnSafe Inc.                          |
| 16 | EPA                     | U.S. Environmental Protection Agency |
| 17 | FOD                     | Frequency of detection               |
| 18 | FRE                     | Fixed-point risk evaluation          |
| 19 | HHRA                    | Human Health Risk Assessment         |
| 20 | HI                      | Hazard index                         |
| 21 | IM                      | Interim measure                      |
| 22 | LUC                     | Land use control                     |
| 23 | MCL                     | Maximum contaminant level            |
| 24 | $\mu\text{m}$           | Micrometer                           |
| 25 | $\mu\text{g}/\text{kg}$ | Microgram per kilogram               |
| 26 | $\mu\text{g}/\text{L}$  | Micrograms per liter                 |
| 27 | $\text{mg}/\text{kg}$   | Milligrams per kilogram              |
| 28 | NAVBASE                 | Naval Base                           |
| 29 | NFA                     | No further action                    |
| 30 | NFI                     | No further investigation             |



# 1 **Acronyms and Abbreviations, Continued**

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|    |        |   |
|----|--------|---|
| 2  | OP     | Organo-phosphate  |
| 3  | OWS    | Oil/water separator   |
| 4  | PAH    | Polycyclic aromatic hydrocarbon                               |
| 5  | PCB    | Polychlorinated biphenyl                                      |
| 6  | RBC    | Risk-based concentration                                      |
| 7  | RCRA   | Resource Conservation and Recovery Act                        |
| 8  | RFA    | RCRA Facility Assessment                                      |
| 9  | RFI    | RCRA Facility Investigation                                   |
| 10 | SCDHEC | South Carolina Department of Health and Environmental Control |
| 11 | SSL    | Soil screening level  |
| 12 | SVOC   | Semivolatile organic compound                                 |
| 13 | SWMU   | Solid waste management unit                                   |
| 14 | TDS    | Total dissolved solids  |
| 15 | TEQ    | TCDD-equivalent   |
| 16 | TOC    | Total organic carbon  |
| 17 | VOC    | Volatile organic compound                                     |
| 18 | UST    | Underground storage tank                                      |



# 1.0 Introduction

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In 1993, Naval Base (NAVBASE) Charleston was added to the list of bases scheduled for closure as part of the Defense Base Realignment and Closure Act (BRAC), which regulates closure and transition of property to the community. The Charleston Naval Complex (CNC) was formed as a result of the dis-establishment of the Charleston Naval Shipyard and NAVBASE on April 1, 1996.

Corrective Action (CA) activities are being conducted under the Resource Conservation and Recovery Act (RCRA) with the South Carolina Department of Health and Environmental Control (SCDHEC) as the lead agency for CA activities at the CNC. All RCRA CA activities are performed in accordance with the Final RCRA Part B Permit (Permit No. SC0 170 022 560).

In April 2000, CH2M-Jones was awarded a contract to provide environmental investigation and remediation services at the CNC. This submittal has been prepared by CH2M-Jones to complete the RCRA Facility Investigation (RFI) for Area of Concern (AOC) 583 in Zone E of the CNC. The location of AOC 583 in Zone E is shown in Figure 1-1. Figure 1-2 shows an aerial photograph of AOC 583.

## 1.1 Background

AOC 583 consists of an area in the northeast corner of Building 236. Building 236 is located on Dry Dock Avenue adjacent to the south side of Dry Dock No. 5 in Zone E of the CNC. Building 583 was constructed in 1982 and improved in 1991. The north side of the building contains conference rooms, offices, a locker room, and a pipe fitting shop. The shop area contained a freon recycling and distillation unit, associated piping, and underground storage tanks (USTs). Nine USTs were present at Building 236. Two USTs contained freon, two USTs were unregulated and contained water, and five USTs contained petroleum products. The USTs were located outside the northeast corner of the building. All nine USTs were removed in 1995. In 1986, approximately 200 gallons of rinsate containing paint stripper was discharged outside the northeast end of the building to the stormwater drain.

Building 236 is surrounded by asphalt and concrete pavement. Railroad lines are located approximately 100 feet northwest and northeast of the building. Building 236 is currently being used by Deytons Shipyard, Inc., as an operations center for the shipyard area.

The materials of concern identified based on historical operations for AOC 583 in the *Final Zone E RFI Work Plan, Revision 1* (EnSafe Inc. [EnSafe]/ Allen & Hoshall, 1995) include freon, paints, solvents, and petroleum hydrocarbons. This area of Zone E is zoned M-2 (industrial). The CNC RCRA Permit identified AOC 583 as requiring a RFI.

The RFI was initially conducted by EnSafe, and the *Zone E RFI Report, Revision 0* (EnSafe, 1997) was prepared and submitted during 1997. Regulatory review was conducted on this document and responses to the comments from SCDHEC were prepared by the Navy/EnSafe team. The comments and responses are provided in Appendix A.

## 1.2 Purpose of the RFI Report Addendum

The purpose of this RFI Report Addendum is to document the results of the previous RFI conducted by the Navy/EnSafe team at AOC 583. This RFI Report Addendum also discusses the findings of previous investigations, existing site conditions, and surrounding area land use.

Prior to changing the status of any site in the CNC RCRA CA permit, the BRAC Cleanup Team (BCT) agreed that the following issues should be considered:

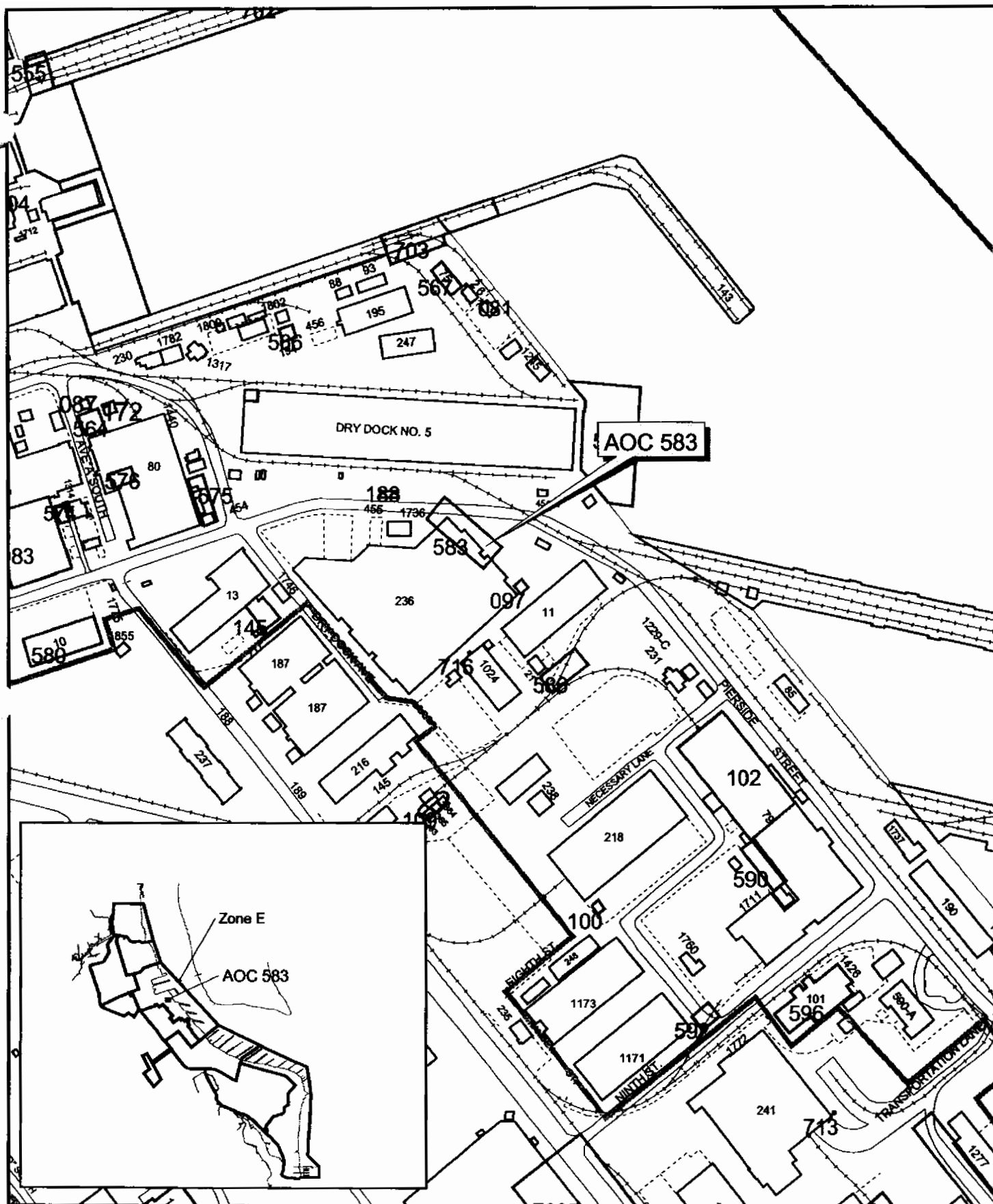
- Status of the RFI
- Presence of metals (inorganics) in groundwater
- Potential linkage to Solid Waste Management Unit (SWMU) 37, Investigated Sanitary Sewers at the CNC
- Potential linkage to AOC 699, Investigated Storm Sewers at the CNC
- Potential linkage of AOC 504, Investigated Railroad Lines at the CNC
- Potential linkage to surface water bodies (Zone J)
- Potential contamination associated with oil/water separators (OWSs)
- Relevance or need for land use controls (LUCs) at the site

Information regarding these issues is also provided in this RFI Report Addendum to expedite evaluation of closure of the site.

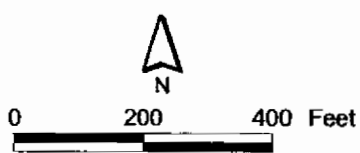
## 1.3 Report Organization

This RFI Report Addendum consists of the following sections, including this introductory section:

- 1    **1.0 Introduction** – Presents the purpose of the report and background information relating  
2        to the RFI Report Addendum.
- 3    **2.0 Summary of RFI Conclusions for AOC 583** – Summarizes the conclusions from the RFI  
4        investigation and risk evaluation for AOC 583 as presented in *the Zone E RFI Report,*  
5        *Revision 0.*
- 6    **3.0 Interim Measures and UST/AST Removals** – Provides information regarding any  
7        interim measures (IMs) or tank removal activities performed at the site.
- 8    **4.0 Summary of Additional Investigations** – Summarizes information, if any, collected  
9        after completion of the *Zone E RFI Report, Revision 0.*
- 10   **5.0 COPC/COC Refinement** – Provides further evaluation of chemicals of potential concern  
11        (COPCs) based on the RFI and additional data used to assess them as chemicals of  
12        concern (COCs).
- 13   **6.0 Summary of Information Related to Site Closeout Issues** – Discusses the various site  
14        closeout issues that the BRAC Cleanup Team (BCT) agreed to evaluate prior to site  
15        closeout.
- 16   **7.0 Recommendations** – Provides recommendations for proceeding with site closure.
- 17   **8.0 References** – Lists the references used in this document.
- 18   **Appendix A** – Contains responses to SCDHEC comments for AOC 583 from the *Zone E RFI*  
19        *Report, Revision 0.*
- 20   **Appendix B** – Contains excerpts from the *Zone E RFI Report, Revision 0*, including  
21        summaries of detected chemicals.
- 22   **Appendix C** – Contains a copy of the *Underground Storage Tank Assessment Report* (Albrecht  
23        & Associates, 1996), as well as the Letter of Comments regarding the UST Report, SCDHEC  
24        (June 3, 1996).
- 25   **Appendix D** – Contains a copy of the memorandum *A Comprehensive Review of Common*  
26        *Laboratory Artifacts Detected in Environmental Samples from the Charleston Naval Base, and the*  
27        *Findings Regarding Trace Level Methylene Chloride and Acetone Contamination* (EnSafe, 1998).
- 28   **Appendix E** – Contains a summary of the detections of methylene chloride in Zone E  
29        “blank” samples.
- 30   All tables and figures appear at the end of their respective sections.



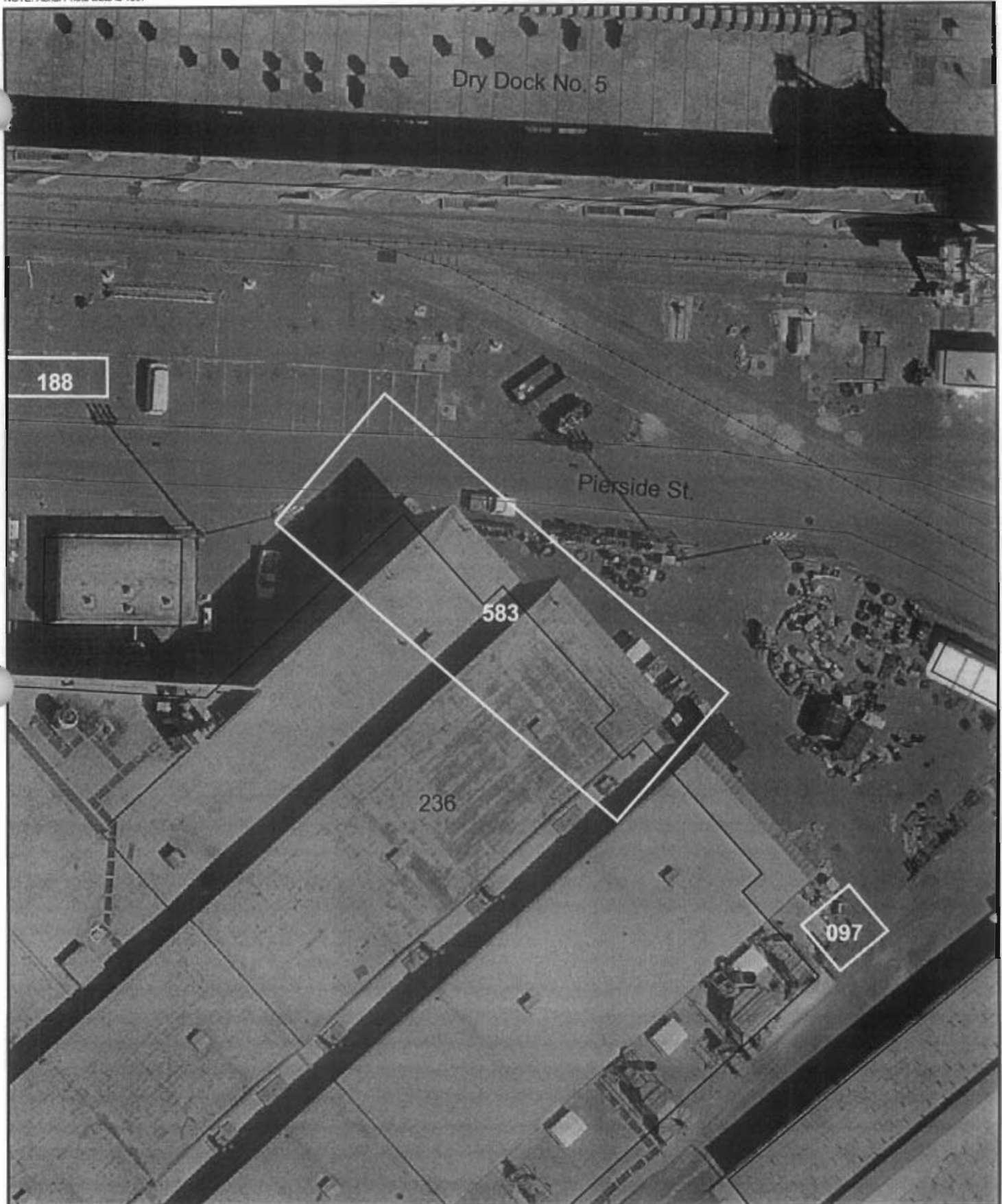
- |               |               |
|---------------|---------------|
| Fence         | Buildings     |
| Railroads     | Zone Boundary |
| Roads         |               |
| Shoreline     |               |
| AOC Boundary  |               |
| SWMU Boundary |               |



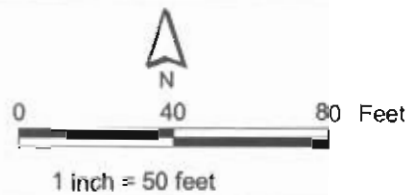
1 inch = 300 feet

**Figure 1-1**  
Location of AOC 583 in Zone E  
Charleston Naval Complex

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- Fence
- Railroads
- Roads
- Shoreline
- AOC/SWMU Boundary
- Buildings
- Zone Boundary



**Figure 1-2**  
Site Map  
AOC 583

Charleston Naval Complex

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## 2.0 Summary of RFI Conclusions for AOC 583

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This section summarizes the results and conclusions from the RFI conducted at AOC 583 which were reported in the *Zone E RFI Report, Revision 0* (EnSafe, 1997). Figure 2-1 shows soil and groundwater sampling locations. Figure 2-2 presents the shallow potentiometric contours in the area of AOC 583.

As part of the Zone E RFI, soil and groundwater investigations were conducted at AOC 583 during 1995-1997. The RFI report presented the results of these investigations and conclusions concerning contamination and risk, as summarized in the following sections. A further evaluation of COCs at AOC 583 is provided in Section 5.0.

Appendix B contains a summary of detected chemicals (Tables 10.41.2.1, 10.41.2.2 and 10.41.4.1 through 10.41.4.4) from the *Zone E RFI Report, Revision 0*.

### 2.1 Soil Sampling and Analysis

Soil was sampled during two sampling events at AOC 583. During the first sampling event, surface and subsurface soil samples were collected from seven soil sampling locations, identified as E583SB001 through E583SB007. The sampling locations are shown in Figure 2-1. Soil samples were analyzed for volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), and metals. One duplicate surface soil sample (583SB00601) was collected and analyzed for an extended list of analytes, including VOCs, SVOCs, metals, hexavalent chromium, herbicides, pesticides (including organo-phosphate [OP]) pesticides, and dioxins.

During the second sampling event, surface and subsurface soil samples were collected from three additional soil sampling locations (E583SB008 through E583SB010). These sampling locations are shown in Figure 2-1. Soil samples (surface and subsurface) collected from soil boring E583SB008 were analyzed for VOCs, SVOCs, polychlorinated biphenyls (PCBs), metals, cation exchange capacity, total organic carbon (TOC), pesticides, and cyanide. Surface soil samples only were collected from soil borings E583SB009 and E583SB010. The sample collected at soil boring E583SB009 (583SB00901) was analyzed for TOC and cation exchange capacity. Sample 583SB01001 was analyzed for VOCs, SVOCs, and metals.

## 2.1.1 Surface Soil Results

During the RFI, surface soil detections of organic compounds were evaluated against the EPA Region III industrial risk-based concentrations (RBCs) (with a hazard index [HI]=0.1 for noncarcinogens). Surface soil detections of inorganic compounds were evaluated against the EPA Region III industrial RBCs (HI=0.1 for noncarcinogens) and the Zone E background reference concentrations (BRCs). The fate and transport section (10.41.5) also compared detected compounds to generic soil screening levels (SSL, dilution attenuation factor [DAF]=10).

Detected concentrations of organic and inorganic compounds for surface soil samples were as follows:

- **VOCs:** VOCs were not detected in surface soil above industrial RBCs. Methylene chloride was detected in surface soil samples 538SB00201 (26 micrograms per kilogram [ $\mu\text{g}/\text{kg}$ ]) and 583SB00601 (28  $\mu\text{g}/\text{kg}$ ) at concentrations that exceeded its SSL (10  $\mu\text{g}/\text{kg}$ ). The RFI report concluded that methylene chloride was not a COC because data indicated that groundwater was not impacted.
- **SVOCs:** SVOCs were not detected in surface soil above industrial RBCs. N-nitroso-di-n-propylamine (47  $\mu\text{g}/\text{kg}$ ) and pentachlorophenol (59  $\mu\text{g}/\text{kg}$ ) were detected above their respective SSLs (0.025  $\mu\text{g}/\text{kg}$  and 15  $\mu\text{g}/\text{kg}$ , respectively) in sample 583SB00601. Because these compounds were not detected in site groundwater samples, existing soil concentrations were considered sufficiently protective of shallow groundwater. Therefore, n-nitroso-di-n-propylamine and pentachlorophenol were not identified as COCs.
- **Inorganics:** Two inorganics, antimony (583SB00802, 3.5 J milligrams per kilogram [ $\text{mg}/\text{kg}$ ]) and chromium (583SB00302, 179 J  $\text{mg}/\text{kg}$ ), were detected in surface soil above their SSLs (2.5  $\text{mg}/\text{kg}$  and 94.6  $\text{mg}/\text{kg}$ , respectively) and BRCs (1.77  $\text{mg}/\text{kg}$  and 94.6  $\text{mg}/\text{kg}$ , respectively). The detected concentrations of antimony and chromium did not exceed their respective industrial RBCs and BRCs. Hexavalent chromium was not detected in surface soil. Because these compounds were not detected in groundwater, existing soil concentrations were considered sufficiently protective of shallow groundwater. Therefore, antimony and chromium were not identified as COCs.
- **Herbicides:** Herbicides were not detected in surface soil.
- **Pesticides:** Pesticides were not detected in surface soil.

- **Dioxins:** Four dioxin congeners were detected in surface soil sample 583SB00601. The calculated dioxin equivalent (TEQ) was below the residential and industrial RBCs.

## 2.1.2 Subsurface Soil Results

During the RFI, subsurface soil detections of organic compounds were compared with generic SSLs (DAF=10). Subsurface soil detections of inorganic compounds were compared with generic SSLs (using a DAF=10) and the Zone E BRCs.

Detected concentrations of organic and inorganic compounds from subsurface soil samples are as follows:

- **VOCs:** VOCs were not detected in subsurface soil above their respective SSLs.
- **SVOCs:** Benzo[a]anthracene (4,100 µg/kg), benzo[b]fluoranthene (3,300 µg/kg), and dibenzo[a,h]anthracene (1,300 µg/kg) were detected above their SSLs (800 µg/kg, 2,500 µg/kg, and 800 µg/kg, respectively) in sample 583SB00702. The calculated benzo[a]pyrene equivalent (BEQ) in sample 583SB00702 was 5,990 µg/kg. Because these compounds were not detected in the first groundwater sampling event, existing soil concentrations were considered sufficiently protective of shallow groundwater. Therefore, benzo[a]anthracene, benzo[b]fluoranthene, and dibenzo[a,h]anthracene were not identified as COCs.
- **Inorganics:** Antimony (583SB00802, 3.9 J mg/kg) was detected in subsurface soil above its SSL (2.5 mg/kg). Because antimony was not detected in the first groundwater sampling event, existing soil concentrations were considered sufficiently protective of shallow groundwater. Therefore antimony was not identified as a COC.
- **Pesticides:** One pesticide, 4,4'-DDE (583SB00802, 0.0039 mg/kg), was detected in subsurface soil. It did not exceed its SSL (27 mg/kg).
- **Cyanide:** Cyanide was not detected in subsurface soil.

## 2.2 Groundwater Sampling and Analysis

Four groundwater sampling events were conducted at AOC 583. However, the Zone E RFI for the site evaluated the data from the first event only. Data for all four groundwater sampling events were provided in Appendix H of the *Zone E RFI Report, Revision 0*.

Groundwater samples were collected from shallow groundwater monitoring wells E583GW001, E583GW002 and E583GW003, and deep groundwater monitoring well E583GW002D. Monitoring well locations are shown in Figure 2-1. Samples from the first

groundwater sampling event were analyzed for VOCs, SVOCs, metals, chlorides, sulfates, and total dissolved solids (TDS). Duplicate groundwater samples were not collected.

Analytical results for the second through fourth sampling events are discussed further in Section 5.0 of this RFI Report Addendum.

### 2.2.1 Shallow Groundwater Results

During the RFI, detections in shallow groundwater samples were compared to the EPA Region III tap-water RBCs, MCLs, and for inorganics in shallow groundwater, the Zone E BRCs.

Detected concentrations of organic and inorganic compounds for shallow groundwater samples were as follows:

- **VOCs:** Acetone was detected in 2 of 3 samples from the first sampling event. The detected concentrations (E583GW002, 56 J micrograms per liter [ $\mu\text{g}/\text{L}$ ] and E583GW003, 7.0 J  $\mu\text{g}/\text{L}$ ) were less than the RBC of 370  $\mu\text{g}/\text{L}$ .
- **SVOCs:** No SVOCs were detected in shallow groundwater.
- **Inorganics:** Inorganics were not detected in shallow groundwater above their respective RBCs and BRCs.

### 2.2.2 Deep Groundwater Results

During the RFI, detections in deep groundwater samples were compared to the EPA Region III tap-water RBCs, MCLs, and for inorganics, the Zone E BRCs.

Detected concentrations of organic and inorganic compounds for deep groundwater samples were as follows:

- **VOCs:** Acetone was detected in the deep groundwater sample taken during the first event. The detected concentration (E583GW02D, 10 J  $\mu\text{g}/\text{L}$ ) was less than the RBC of 370  $\mu\text{g}/\text{L}$ .
- **SVOCs:** SVOCs were not detected in deep groundwater.
- **Inorganics:** Inorganics were not detected in deep groundwater above their respective RBCs and BRCs.

## **2.3 RFI Human Health Risk Assessment (HHRA)**

The *Zone E RFI Report, Revision 0* used a fixed-point risk evaluation (FRE) approach at AOC 583. The FRE considered site resident and site worker scenarios during the FRE. The detailed risk assessment for the AOC 583 site is presented in Section 10.41.6 of the *Zone E RFI Report, Revision 0*.

### **2.3.1 Soils**

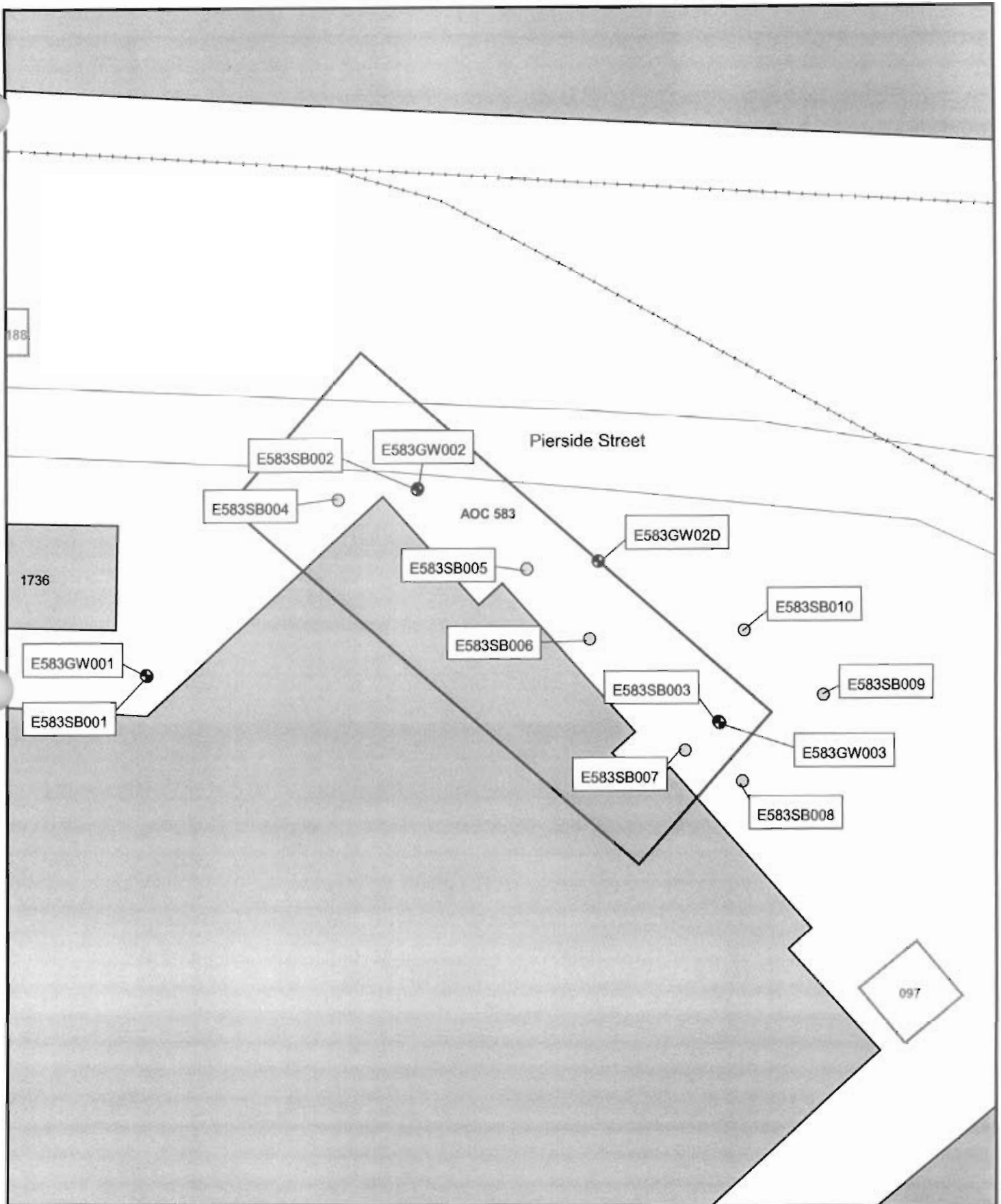
The HHRA for AOC 583 identified BEQs as a COC for surface soil under an unrestricted land use scenario. BEQs are further discussed in Section 5.0 of this RFI Report Addendum. No subsurface soil COCs were identified at AOC 583. COCs were not identified for surface or subsurface soil based on continued industrial land use.

### **2.3.2 Groundwater**

The HHRA for AOC 583 did not identify any COCs for shallow or deep groundwater.

## **2.4 RFI Conclusions and Recommendations**

The *Zone E RFI Report, Revision 0* concluded that based on the analytical results and the FRE, one COC, BEQs were identified for surface soil at AOC 583 for an unrestricted land use scenario. No COCs were identified for environmental media based on industrial land use.



**Figure 2-1**  
Soil Boring and Monitoring Well Locations  
AOC 583, Zone E  
Charleston Naval Complex

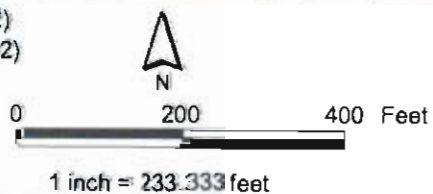
**CH2MHILL**





**Figure 2-2**  
Shallow Groundwater Contours  
AOC 583, Zone E  
Charleston Naval Complex

- Known Shallow Groundwater Contour (5/14/02)
- Inferred Shallow Groundwater Contour (5/14/02)
- Fence
- Railroads
- Roads
- Groundwater Well
- AOC Boundary
- SWMJ Boundary
- Buildings
- Zone Boundary







## 1    **3.0 Interim Measures and UST/AST Removals**

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### 2    **3.1 UST/AST Removals**

3    No aboveground storage tanks (AST) were identified at AOC 583.

4    Nine USTs were located at AOC 583. Two USTs were used to store freon, five USTs were  
5    used to store petroleum products, and the remaining two USTs were unregulated and  
6    contained water. The USTs were removed in August 1995 (Albrecht & Associates, 1996).

7    Albrecht & Associates submitted the *Underground Storage Tank Assessment Report* in January  
8    1996. On June 3, 1996 SCDHEC issued a letter in response to the closure report. The site was  
9    not closed based on SCDHEC's concerns regarding a potential release from UST #5 and  
10    analytical data from samples that exceeded appropriate holding times. The *Underground*  
11    *Storage Tank Assessment Report* and SCDHEC's letter are presented in Appendix C.

12    The *Final Zone E RFI Work Plan* (EnSafe/Allen & Hoshall, 1995) was developed prior to  
13    removal of the USTs at the site. However, potential releases from the USTs were the focus of  
14    the RFI. The stated objectives of the field investigation were to determine the integrity of the  
15    tanks and to determine the presence or absence of COPCs related to site activities. Sampling  
16    locations were chosen to meet these objectives.

17    The integrity of the USTs was determined by visual inspection during removal. The  
18    assessment report indicated that all seven regulated USTs were free of visible corrosion,  
19    pitting, and holes.

20    Soil samples collected as part of the Zone E RFI were analyzed for VOCs (including  
21    analyses for benzene, toluene, ethylbenzene, and xylenes [BTEX]) and SVOCs (including  
22    naphthalene and polynuclear aromatic hydrocarbons [PAHs]). Evaluation of these data did  
23    not indicate the presence of a petroleum source. Additionally, SVOCs were not detected in  
24    site groundwater samples and VOCs were not detected in groundwater at concentrations  
25    above MCLs (or RBCs). Based on these data and the fact that the USTs were the focus of the  
26    RFI at AOC 583, further investigation of the removed USTs is not warranted.

### 27    **3.2 Interim Measures**

28    There were no IMs conducted at AOC 583.



## 1 **4.0 Summary of Additional Investigations**

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- 2 No additional investigations have been conducted at AOC 583 since the RFI was completed  
3 by the Navy/EnSafe team during 1995-1997.



## 5.0 COPC/COC Refinement

The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified BEQs as COCs for surface soil at AOC 583 under an unrestricted (i.e., residential) land use scenario. While residential use of property within Zone E is not planned or likely, this section presents the BEQ data and compares them against current screening criteria adopted by the BCT for the CNC project. The current screening criteria includes comparing soil BEQ concentrations to the sitewide BEQ reference concentrations.

The *Zone E RFI Report, Revision 0* did not identify any soil or groundwater COCs for AOC 583 for the future industrial land use scenario, based on the screening criteria presented in the RFI report.

The BCT has agreed that VOCs detected in soil should be screened against a generic SSL based on a DAF of 1. This section also presents the re-screening of the VOC data. Additionally, the RFI report evaluated only the data from the first groundwater sampling event for AOC 583. This section evaluates compounds that were detected in the second through fourth groundwater sampling events.

### 5.1 VOCs in Soil

Acetone, carbon disulfide, and methylene chloride were detected in soil samples at AOC 583. Tables 5-1 and 5-2 summarize the detections of VOCs in AOC 583 samples for surface and subsurface soil, respectively.

Only methylene chloride was detected above its generic SSL (0.001 mg/kg, DAF=1) in soil. Methylene chloride was not detected in site groundwater samples, indicating that the current soil-groundwater equilibrium is sufficiently protective of groundwater. In addition, methylene chloride is a common laboratory contaminant.

Because methylene chloride concentrations in several soil samples exceeded its generic SSL, a site-specific SSL was calculated for both the unpaved and paved scenarios. The reported concentrations of methylene chloride were compared to the site-specific SSLs. The SSL calculation is consistent with the EPA's *Soil Screening Guidance: User's Guide* (EPA, 1996a) and the *Soil Screening Guidance: Technical Background Document* (EPA, 1996b). Table 5-3 presents the SSL calculations and input parameters. The table shows the calculation of SSLs

1 for both paved and unpaved site conditions. The unpaved and paved SSLs are also shown  
2 in Tables 5-1 and 5-2.

3 Comparison of detected concentrations of methylene chloride to the site-specific SSLs  
4 resulted in four of the 16 soil samples exceeding the unpaved SSL. All samples contained  
5 methylene chloride at concentrations below the paved SSL.

6 Because individual exceedances of the SSL do not necessarily represent a threat to local  
7 groundwater, the mean methylene chloride concentration was compared to the site-specific  
8 SSLs. Table 5-4 presents the reported VOC concentrations and the calculated mean  
9 concentrations. The detected concentration of each sample was used in the calculation of the  
10 mean concentration. For samples where methylene chloride was not detected, one-half of  
11 the reported value was used in the calculation.

12 As can be seen in Table 5-4, the mean concentration of methylene chloride (0.011 mg/kg) is  
13 below the paved and unpaved site-specific SSLs. It was not detected in site groundwater  
14 and is not expected to represent a threat to shallow groundwater, even when based on an  
15 unpaved scenario. There is currently a building located on this site, and the site is expected  
16 to remain paved. Therefore migration of methylene chloride is highly unlikely. Based on  
17 this information, methylene chloride is not considered to be a COC at AOC 583.

18 Methylene chloride is also known to be a common laboratory contaminant. It has been  
19 detected in grid and blank samples. EnSafe evaluated the presence of acetone, methylene  
20 chloride, and bis(2-ethylhexyl)phthalate in environmental samples at the CNC. A  
21 memorandum written by Charlie Vernoy/EnSafe to the BCT, dated February 12, 1998,  
22 presents the findings from this analysis. Appendix D contains a copy of the memorandum.  
23 The evaluation concluded that concentrations at less than 100 parts per billion (ppb) (0.1  
24 mg/kg) "should be considered to be field and/or laboratory contaminants." The  
25 methylene chloride concentrations detected in soil at AOC 583 are all below this level,  
26 suggesting that they may be sampling or laboratory artifacts and thus should not be  
27 considered COCs.

28 A review of the Zone E equipment blank (EB), field blank (FB), laboratory blank (LB), and  
29 trip blank (TB) data was also been conducted. Table 5-5 presents a summary of the data for  
30 the blank samples. Methylene chloride was detected in 151 of 331 (45.6%) blank samples.  
31 Frequency of detection (FOD) values ranged from 44.8% (EB) to 46.7% (FB). Detected  
32 concentrations of methylene chloride in blank samples ranged from 1 to 47 µg/L. These  
33 data support the conclusion that methylene chloride concentrations at AOC 583 are likely

1 sampling and/or laboratory artifacts. Based on the preceding discussion, methylene  
2 chloride is not considered a COC for soil at AOC 583.

## 3 **5.2 Groundwater**

4 Four groundwater sampling events were conducted at AOC 583 as part of the RFI. The data  
5 for all four sampling events are included in Appendix H of the *Zone E RFI Report, Revision 0*.  
6 However, the RFI and risk assessment screening for AOC 583 were based on the first round  
7 of groundwater data only. Tables 5-6 and 5-7 present the compounds that were detected in  
8 the second through fourth sampling events for shallow and deep groundwater,  
9 respectively.

10 The analytical results from the groundwater samples were compared to maximum  
11 contaminant levels (MCLs), where available, or EPA Region III RBCs (HI=0.1) for  
12 compounds where MCLs were not available. Inorganic compounds were also compared to  
13 Zone E background concentrations. COPCs were identified based on exceedances of both  
14 the MCL (or RBC, as noted above) and the range of background concentrations (for  
15 inorganics). Background levels were not established for sodium, and other screening criteria  
16 are not available, as sodium is an essential nutrient.

17 The data in Tables 5-6 and 5-7 show that inorganic compounds were all within the range of  
18 background concentrations or below their respective MCLs (or RBCs [HI=0.1]) Detected  
19 VOCs were all below their respective MCLs or RBCs (HI=0.1). Based on this information,  
20 groundwater COPCs were not identified at AOC 583.

## 21 **5.3 BEQs in Surface Soil**

22 BEQs were identified as a surface soil COC under the unrestricted land use scenario in the  
23 *Zone E RFI Report, Revision 0*. Calculated BEQ values in surface soil ranged from 101 to 469  
24  $\mu\text{g}/\text{kg}$  in samples where carcinogenic polynuclear aromatic hydrocarbons (cPAHs [BEQs])  
25 were detected (see Appendix B, Table 10.41.2.1 of the *Zone E RFI Report, Revision 0*). BEQs  
26 were detected in five of the nine surface soil samples analyzed for SVOCs. All five samples  
27 where BEQs were detected exceeded the EPA Region III residential RBC of 87  $\mu\text{g}/\text{kg}$ .

28 Subsequent to completion of the *Zone E RFI Report, Revision 0*, CH2M-Jones evaluated the  
29 anthropogenic presence of PAHs (CH2M-Jones, 2001). Sitewide reference concentrations of  
30 1,304  $\mu\text{g}/\text{kg}$  for surface soil and 1,400  $\mu\text{g}/\text{kg}$  for subsurface soil were accepted by the BCT  
31 for BEQs.

- 1 The maximum calculated BEQ value (469  $\mu\text{g}/\text{kg}$ ) was compared to the current background
- 2 screening criterion. Based on this comparison, all surface soil BEQ concentrations are below
- 3 the appropriate background level. Therefore, BEQs in surface soil at AOC 583 are not
- 4 considered to be a COC.

## 5 **5.4 COC Summary**

- 6 Based on current screening criteria adopted by the BCT, no COCs were identified in soil or
- 7 groundwater for unrestricted or industrial land use at AOC 583.



**TABLE 5-1**  
 Volatile Organic Compounds Detected in Surface Soil  
 RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Compound              | Station ID | Sample ID  | Date<br>Collected | Concentration |           | SSL <sub>generic</sub><br>(DAF=1) | SSL <sub>unpaved</sub><br>(DAF=6.8) | SSL <sub>paved</sub><br>(DAF=80) |
|-----------------------|------------|------------|-------------------|---------------|-----------|-----------------------------------|-------------------------------------|----------------------------------|
|                       |            |            |                   | (mg/kg)       | Qualifier |                                   |                                     |                                  |
| Acetone               | E583SB002  | 583SB00201 | 09/15/1995        | 0.093         | =         | 0.8                               | NA                                  | NA                               |
| Methylene<br>Chloride | E583SB003  | 583SB00301 | 09/18/1995        | 0.002         | J         | 0.001                             | 0.022                               | 0.26                             |
|                       | E583SB001  | 583SB00101 | 09/15/1995        | 0.005         | J         |                                   |                                     |                                  |
|                       | E583SB006  | 583SB00601 | 09/15/1995        | <b>0.028</b>  | =         |                                   |                                     |                                  |
|                       | E583SB002  | 583SB00201 | 09/15/1995        | <b>0.026</b>  | =         |                                   |                                     |                                  |

All values are presented in units of milligrams per kilogram (mg/kg).

SSL<sub>generic</sub> values are from the *Soil Screening Guidance* (EPA, 1996) except for 2-butanone which is from the EPA Region III RBC table (10/5/2000).

SSL<sub>unpaved</sub> values are calculated for site- and chemical-specific data (see Table 5-3).

SSL<sub>paved</sub> values are calculated for site- and chemical-specific data (see Table 5-3).

**Bold** values exceed the SSL<sub>unpaved</sub> value.

J indicates that the compound was detected, the reported concentration is estimated.

= indicates that the compound was detected, the reported concentration is the measured concentration.

**TABLE 5-2**  
 Volatile Organic Compounds Detected in Subsurface Soil  
 RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Compound           | Station ID | Sample ID  | Date<br>Collected | Concentration |           | SSL <sub>generic</sub><br>(DAF=1) | SSL <sub>unpaved</sub><br>(DAF=6.8) | SSL <sub>paved</sub><br>(DAF=80) |
|--------------------|------------|------------|-------------------|---------------|-----------|-----------------------------------|-------------------------------------|----------------------------------|
|                    |            |            |                   | (mg/kg)       | Qualifier |                                   |                                     |                                  |
| Acetone            | E583SB004  | 583SB00402 | 09/15/1995        | 0.04          | =         | 0.8                               | NA                                  | NA                               |
|                    | E583SB005  | 583SB00502 | 09/15/1995        | 0.024         | =         |                                   |                                     |                                  |
|                    | E583SB003  | 583SB00302 | 09/18/1995        | 0.066         | =         |                                   |                                     |                                  |
|                    | E583SB007  | 583SB00702 | 09/18/1995        | 0.11          | =         |                                   |                                     |                                  |
| Carbon Disulfide   | E583SB006  | 583SB00602 | 09/15/1995        | 0.033         | =         | 2                                 | NA                                  | NA                               |
| Methylene Chloride | E583SB004  | 583SB00402 | 09/15/1995        | 0.004         | J         | 0.001                             | 0.022                               | 0.26                             |
|                    | E583SB007  | 583SB00702 | 09/18/1995        | 0.002         | J         |                                   |                                     |                                  |
|                    | E583SB006  | 583SB00602 | 09/15/1995        | <b>0.037</b>  | =         |                                   |                                     |                                  |
|                    | E583SB001  | 583SB00102 | 09/15/1995        | 0.002         | J         |                                   |                                     |                                  |
|                    | E583SB005  | 583SB00502 | 09/15/1995        | <b>0.029</b>  | =         |                                   |                                     |                                  |

All values are presented in units of milligrams per kilogram (mg/kg).

SSL<sub>generic</sub> values are from the *Soil Screening Guidance* (EPA, 1996) except for 2-butanone which is from the EPA Region III RBC table (10/5/2000).

SSL<sub>unpaved</sub> values are calculated for site- and chemical-specific data (see Table 5-3).

SSL<sub>paved</sub> values are calculated for site- and chemical-specific data (see Table 5-3).

**Bold** values exceed the SSL<sub>unpaved</sub> value.

J indicates that the compound was detected, the reported concentration is estimated.

= indicates that the compound was detected, the reported concentration is the measured concentration.

NA Not applicable/not available

Table 5-3 SSL Calculation for Methylene Chloride  
RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

|   |   |   |  | Parameter  | Methylene chloride   |
|---|---|---|--|--|----------------------|
| <b>Chemical Specific Input Parameters</b>   |   |   |  |  |                      |
| Cw  | = | Target groundwater concentration MCL (mg/L)   |  |  | 5.00E-03             |
| H   | = | Henry's Law Constant, dimensionless   |  |  | 8.98E-02             |
| ks  | = | Soil-water sorption coefficient (cm <sup>3</sup> water / g soil = L/kg) = Koc x foc where<br>koc = organic carbon-water sorption coefficient, (cm <sup>3</sup> (ml) water) / (g soluble organic carbon)<br>foc = Fraction of organic content, dimensionless |  | 0.037  | 4.33E-01<br>1.17E+01 |
| <b>Site Specific Input Parameters</b>   |   |   |  |  |                      |
| Sw  | = | Width of Source Parallel to Groundwater Flow Direction (impacted soil zone)   | 51.8 m   | 170 ft   |                      |
| da  | = | Aquifer Thickness   | 7.3 m  | 24 ft  |                      |
| d   | = | Groundwater Mixing Zone thickness (paved)   | 5.55 m   | 18.2 ft  |                      |
|   |   | (unpaved)   | 6.52 m   | 21.4 ft  |                      |
| i   | = | Groundwater Gradient  | 2.9E-02 (unitless)   |  |                      |
| Ks  | = | Saturated Hydraulic Conductivity  | 222.5 m/yr   | 730.0 ft/yr  |                      |
| θw  | = | Volumetric Water Content of Soil Pore Space   | 0.3 cm <sup>3</sup> <sub>vapor</sub> /cm <sup>3</sup> <sub>soil</sub>  | 0.3 in <sup>3</sup> <sub>vapor</sub> /in <sup>3</sup> <sub>soil</sub>  |                      |
| θv  | = | Volumetric Vapor Content of Soil Pore Space   | 0.15 cm <sup>3</sup> <sub>vapor</sub> /cm <sup>3</sup> <sub>soil</sub> | 0.15 in <sup>3</sup> <sub>vapor</sub> /in <sup>3</sup> <sub>soil</sub> |                      |
| ρs  | = | Soil Bulk Density   | 1.5 g/cm <sup>3</sup>  | 93.64 lbm/ft <sup>3</sup>  |                      |
| qi  | = | Water Infiltration Rate (paved)   | 0.0085 m/yr  | 0.0283 ft/yr   |                      |
|   |   | (unpaved)   | 0.1372 m/yr  | 0.4500 ft/yr   |                      |
| Partition Term, Cw/Csoil, (L/kg)  |   |   |  |  | 6.42E-01             |
| Dilution Term, dimensionless  |   |   |  | (paved)  | 7.99E+01             |
|   |   |   |  | (unpaved)  | 8.83E+00             |
| Csoil/Cw = Partition term * Dilution term (mg/kg / mg/L) = L/kg                             |   |   |  | (paved)  | 5.13E+01             |
|   |   |   |  | (unpaved)  | 4.39E+00             |
| <b>Calculated Site Specific Target Level for Soil</b>                                       |   |   |  |  |                      |
| Csoil calculated source soil concentration (SSL, mg/kg) Cw*(partition term)*(dilution term) |   |   |  | (paved)  | 0.26                 |
|   |   |   |  | (unpaved)  | 0.022                |

Cw is the MCL from EPA National Drinking Water Standards (March 2001) or US EPA Region III RBCs (October, 2000).  
H from Table 36 of the Soil Screening Guidance; Technical Background Document (EPA, 1996).  
ks = koc x foc.  
koc from Table 38 of the Soil Screening Guidance; Technical Background Document (EPA, 1996).  
foc calculated as the mean foc from TOC measurements from Zone E.  
Sw Estimated as the distance along gw flow path (length, NW-SE) of AOC 583 (170 ft).  
d is calculated as  $M = (0.0112 L^{3/5} + da(1 - e^{-L^{1/5} da}))$  or da, whichever is less.  
da is based on top of Ashley (-20 ft, GIS) and nearest isocontour line for groundwater level (4 ft msl, GIS).  
i Calculated from isocontour groundwater map for Zone E ([3.5-2]/52.5 - 0.029, CH2MHill, 2002).  
Ks Based on CH2MHill's hydraulic conductivity theme in the GIS (2 ft/d).  
θw is the default value presented in the Soil Screening Guidance: User's Guide (EPA, 1996).  
θv is calculated as total porosity (0.45, assumed) - θw (0.3) = 0.15.  
ρs is the default value presented in the Soil Screening Guidance: User's Guide (EPA, 1996).  
qi is a derived value (unpaved, 5.4 in/yr or paved, 0.34 in/yr) based on annual precipitation, evapo-transportation, and runoff coefficient values for the Charleston area.

**TABLE 5-4**

Calculated Mean Concentration and SSL Comparison

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Chemical           | Station ID | Sample ID  | Date Collected | Concentration |           | Mean Concentration <sup>a</sup> | SSL <sub>Unpaved</sub> (DAF=6.8) | SSL <sub>paved</sub> (DAF=80) |      |
|--------------------|------------|------------|----------------|---------------|-----------|---------------------------------|----------------------------------|-------------------------------|------|
|                    |            |            |                | (mg/kg)       | Qualifler |                                 |                                  |                               |      |
| Methylene Chloride | E583SB001  | 583SB00101 | 09/15/1995     | 0.005         | J         | 0.005                           | 0.011                            | 0.022                         | 0.26 |
|                    |            | 583SB00102 | 09/15/1995     | 0.002         | J         | 0.002                           |                                  |                               |      |
|                    | E583SB002  | 583SB00201 | 09/15/1995     | <b>0.026</b>  | =         | 0.026                           |                                  |                               |      |
|                    |            | 583SB00202 | 09/15/1995     | 0.006         | U         | 0.003                           |                                  |                               |      |
|                    | E583SB003  | 583SB00301 | 09/18/1995     | 0.002         | J         | 0.002                           |                                  |                               |      |
|                    |            | 583SB00302 | 09/18/1995     | 0.006         | U         | 0.003                           |                                  |                               |      |
|                    | E583SB004  | 583SB00401 | 09/15/1995     | 0.006         | U         | 0.003                           |                                  |                               |      |
|                    |            | 583SB00402 | 09/15/1995     | 0.004         | J         | 0.004                           |                                  |                               |      |
|                    | E583SB005  | 583SB00501 | 09/15/1995     | 0.006         | U         | 0.003                           |                                  |                               |      |
|                    |            | 583SB00502 | 09/15/1995     | <b>0.029</b>  | =         | 0.029                           |                                  |                               |      |
|                    | E583SB006  | 583SB00601 | 09/15/1995     | <b>0.028</b>  | =         | 0.028                           |                                  |                               |      |
|                    |            | 583SB00602 | 09/15/1995     | <b>0.037</b>  | =         | 0.037                           |                                  |                               |      |
|                    | E583SB007  | 583SB00701 | 09/18/1995     | 0.024         | U         | 0.012                           |                                  |                               |      |
|                    |            | 583SB00702 | 09/18/1995     | 0.002         | J         | 0.002                           |                                  |                               |      |
|                    | E583SB008  | 583SB00801 | 05/30/1996     | 0.024         | U         | 0.012                           |                                  |                               |      |
|                    |            | 583SB00802 | 05/30/1996     | 0.022         | U         | 0.011                           |                                  |                               |      |

All values are presented in units of milligrams per kilogram (mg/kg).

<sup>a</sup> Mean concentration was calculated using the reported value for samples where the compound was detected and 1/2 the reported value for non-detects (U and UU) unless noted. Otherwise, U indicates that the compound was not detected, the reported concentration is the detection limit.

J indicates that the compound was detected, the reported concentration is an estimated concentration.

= indicates that the compound was detected, the reported concentration is the measured concentration.

**Bold values** are exceedances of the unpaved SSL (SSL<sub>unpaved</sub>).

**TABLE 5-5**  
 Frequency of Detection of Methylene Chloride in Zone E Blank Samples  
*RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex*

| Blank Type            | Sampling Period        | Frequency of Detection    | Range of Detected Concentrations |
|-----------------------|------------------------|---------------------------|----------------------------------|
| Equipment Blank (EB)  | 8/30/1995 - 12/12/1996 | 30 / 67 or 44.8%          | 1 - 26 $\mu\text{g/L}$           |
| Field Blank (FB)      | 1/23/1996 - 12/12/1996 | 14 / 30 or 46.7%          | 2 - 30 $\mu\text{g/L}$           |
| Laboratory Blank (LB) | 9/20/1996              | 1 / 1 or 100%             | 12 $\mu\text{g/kg}$              |
| Trip Blank (TB)       | 8/28/1995 - 12/13/1996 | 106 / 233 or 45.5%        | 1 - 47 $\mu\text{g/L}$           |
| <b>Total</b>          |                        | <b>151 / 331 or 45.6%</b> |                                  |

$\mu\text{g/kg}$  Micrograms per kilogram

$\mu\text{g/L}$  Micrograms per liter

The complete data table is presented in Appendix E of this report.

**TABLE 5-6**  
Compounds Detected in Shallow Groundwater (Sampling Events 2 through 4)  
RFI Report Addendum, AOC 583, Charleston Naval Complex, Zone E

| Chemical  | Station ID | Sample ID  | Date<br>Collected | Concentration |           | MCL   | EPA<br>Region III<br>RBC<br>(HI=0.1) | Zone E<br>Background<br>Range |
|-----------|------------|------------|-------------------|---------------|-----------|-------|--------------------------------------|-------------------------------|
|           |            |            |                   | (µg/L)        | Qualifier |       |                                      |                               |
| Metals    |            |            |                   |               |           |       |                                      |                               |
| Aluminum  | E583GW001  | 583GW00102 | 07/16/1996        | 72            | J         | NA    | 3,700                                | 19 - 16,100                   |
|           | E583GW003  | 583GW00302 | 07/17/1996        | 76.8          | J         |       |                                      |                               |
|           | E583GW001  | 583GW00103 | 11/04/1996        | 239           | =         |       |                                      |                               |
|           | E583GW003  | 583GW00303 | 11/05/1996        | 34.4          | J         |       |                                      |                               |
|           | E583GW001  | 583GW00104 | 01/16/1997        | 104           | J         |       |                                      |                               |
|           | E583GW003  | 583GW00304 | 01/16/1997        | 109           | J         |       |                                      |                               |
| Arsenic   | E583GW002  | 583GW00204 | 01/16/1997        | 2.9           | J         | 50    | NA                                   | 3 - 316                       |
| Barium    | E583GW001  | 583GW00102 | 07/16/1996        | 29.           | =         | 2,000 | NA                                   | 6 - 398                       |
|           | E583GW002  | 583GW00202 | 07/16/1996        | 14.7          | =         |       |                                      |                               |
|           | E583GW001  | 583GW00103 | 11/04/1996        | 68.3          | J         |       |                                      |                               |
|           | E583GW003  | 583GW00303 | 11/05/1996        | 9             | J         |       |                                      |                               |
|           | E583GW002  | 583GW00203 | 11/05/1996        | 13.1          | J         |       |                                      |                               |
|           | E583GW003  | 583GW00304 | 01/16/1997        | 8.1           | J         |       |                                      |                               |
|           | E583GW002  | 583GW00204 | 01/16/1997        | 11            | J         |       |                                      |                               |
|           | E583GW001  | 583GW00104 | 01/16/1997        | 36.9          | J         |       |                                      |                               |
| Beryllium | E583GW001  | 583GW00102 | 07/16/1996        | 0.36          | J         | 4     | NA                                   | 0.3 - 0.9                     |
|           | E583GW002  | 583GW00202 | 07/16/1996        | 0.32          | J         |       |                                      |                               |
|           | E583GW003  | 583GW00302 | 07/17/1996        | 0.53          | J         |       |                                      |                               |
|           | E583GW002  | 583GW00204 | 01/16/1997        | 0.77          | J         |       |                                      |                               |
|           | E583GW001  | 583GW00104 | 01/16/1997        | 0.82          | J         |       |                                      |                               |
|           | E583GW003  | 583GW00304 | 01/16/1997        | 0.63          | J         |       |                                      |                               |
| Calcium   | E583GW002  | 583GW00201 | 03/25/1996        | 67,700        | J         | NA    | EN                                   | 1,170 - 260,000               |
|           | E583GW003  | 583GW00301 | 03/26/1996        | 65,600        | J         |       |                                      |                               |
|           | E583GW001  | 583GW00102 | 07/16/1996        | 16,400        | =         |       |                                      |                               |
|           | E583GW002  | 583GW00202 | 07/16/1996        | 79,800        | =         |       |                                      |                               |
|           | E583GW003  | 583GW00302 | 07/17/1996        | 61,900        | =         |       |                                      |                               |
|           | E583GW001  | 583GW00103 | 11/04/1996        | 41,600        | =         |       |                                      |                               |

**TABLE 5-6**  
 Compounds Detected in Shallow Groundwater (Sampling Events 2 through 4)  
 RFI Report Addendum, AOC 583, Charleston Naval Complex, Zone E

| Chemical        | Station ID | Sample ID  | Date Collected | Concentration |           | MCL   | EPA Region III RBC (HI=0.1) | Zone E Background Range |
|-----------------|------------|------------|----------------|---------------|-----------|-------|-----------------------------|-------------------------|
|                 |            |            |                | (µg/L)        | Qualifier |       |                             |                         |
| Calcium         | E583GW003  | 583GW00303 | 11/05/1996     | 63,000        | =         | NA    | EN                          | 1,170 - 260,000         |
|                 | E583GW002  | 583GW00203 | 11/05/1996     | 82,600        | =         |       |                             |                         |
|                 | E583GW002  | 583GW00204 | 01/16/1997     | 79,000        | =         |       |                             |                         |
|                 | E583GW001  | 583GW00104 | 01/16/1997     | 21,600        | =         |       |                             |                         |
|                 | E583GW003  | 583GW00304 | 01/16/1997     | 66,300        | =         |       |                             |                         |
| Chromium, Total | E583GW001  | 583GW00103 | 11/04/1996     | 0.94          | J         | 100   | NA                          | 0.8 - 31                |
|                 | E583GW003  | 583GW00304 | 01/16/1997     | 2.7           | J         |       |                             |                         |
|                 | E583GW002  | 583GW00204 | 01/16/1997     | 2.4           | J         |       |                             |                         |
|                 | E583GW001  | 583GW00104 | 01/16/1997     | 23.2          | =         |       |                             |                         |
| Cobalt          | E583GW001  | 583GW00101 | 03/25/1996     | 3.7           | J         | NA    | 220                         | 0.9 - 44                |
|                 | E583GW001  | 583GW00102 | 07/16/1996     | 1.8           | J         |       |                             |                         |
|                 | E583GW001  | 583GW00103 | 11/04/1996     | 6             | J         |       |                             |                         |
| Copper          | E583GW003  | 583GW00304 | 01/16/1997     | 1.7           | J         | 1,300 | NA                          | 0.9 - 8                 |
|                 | E583GW001  | 583GW00104 | 01/16/1997     | 2             | J         |       |                             |                         |
|                 | E583GW002  | 583GW00204 | 01/16/1997     | 1.1           | J         |       |                             |                         |
| Iron            | E583GW001  | 583GW00102 | 07/16/1996     | 1,400         | =         | NA    | 1,100                       | 144 - 76,600            |
|                 | E583GW002  | 583GW00202 | 07/16/1996     | 71.5          | J         |       |                             |                         |
|                 | E583GW003  | 583GW00302 | 07/17/1996     | 234           | =         |       |                             |                         |
|                 | E583GW001  | 583GW00103 | 11/04/1996     | 4,640         | =         |       |                             |                         |
|                 | E583GW003  | 583GW00303 | 11/05/1996     | 242           | =         |       |                             |                         |
|                 | E583GW002  | 583GW00204 | 01/16/1997     | 80.8          | J         |       |                             |                         |
|                 | E583GW003  | 583GW00304 | 01/16/1997     | 253           | =         |       |                             |                         |
|                 | E583GW001  | 583GW00104 | 01/16/1997     | 2,010         | =         |       |                             |                         |
| Lead            | E583GW001  | 583GW00101 | 03/25/1996     | 5.2           | =         | 15    | NA                          | 2 - 47                  |
| Magnesium       | E583GW001  | 583GW00101 | 03/25/1996     | 4,800         | J         | NA    | EN                          | 790 - 1,160,000         |
|                 | E583GW002  | 583GW00201 | 03/25/1996     | 7,060         | =         |       |                             |                         |
|                 | E583GW003  | 583GW00301 | 03/26/1996     | 30,000        | =         |       |                             |                         |

**TABLE 5-6**  
 Compounds Detected in Shallow Groundwater (Sampling Events 2 through 4)  
 RFI Report Addendum, AOC 583, Charleston Naval Complex, Zone E

| Chemical  | Station ID | Sample ID  | Date Collected | Concentration |           | MCL | EPA Region III RBC (HI=0.1) | Zone E Background Range |
|-----------|------------|------------|----------------|---------------|-----------|-----|-----------------------------|-------------------------|
|           |            |            |                | (µg/L)        | Qualifier |     |                             |                         |
| Magnesium | E583GW001  | 583GW00102 | 07/16/1996     | 4,040         | =         | NA  | EN                          | 790 - 1,160,000         |
|           | E583GW002  | 583GW00202 | 07/16/1996     | 9,290         | =         |     |                             |                         |
|           | E583GW003  | 583GW00302 | 07/17/1996     | 30,300        | =         |     |                             |                         |
|           | E583GW001  | 583GW00103 | 11/04/1996     | 7,770         | =         |     |                             |                         |
|           | E583GW003  | 583GW00303 | 11/05/1996     | 34,600        | =         |     |                             |                         |
|           | E583GW002  | 583GW00203 | 11/05/1996     | 9,340         | =         |     |                             |                         |
|           | E583GW002  | 583GW00204 | 01/16/1997     | 9,020         | =         |     |                             |                         |
|           | E583GW003  | 583GW00304 | 01/16/1997     | 33,300        | =         |     |                             |                         |
|           | E583GW001  | 583GW00104 | 01/16/1997     | 4,910         | J         |     |                             |                         |
| Manganese | E583GW002  | 583GW00201 | 03/25/1996     | 8.9           | J         | NA  | 73                          | 2 - 2,650               |
|           | E583GW001  | 583GW00101 | 03/25/1996     | 49.4          | =         |     |                             |                         |
|           | E583GW003  | 583GW00301 | 03/26/1996     | 38.2          | =         |     |                             |                         |
|           | E583GW001  | 583GW00102 | 07/16/1996     | 41.8          | =         |     |                             |                         |
|           | E583GW002  | 583GW00202 | 07/16/1996     | 11.3          | =         |     |                             |                         |
|           | E583GW003  | 583GW00302 | 07/17/1996     | 47.1          | =         |     |                             |                         |
|           | E583GW001  | 583GW00103 | 11/04/1996     | 119           | J         |     |                             |                         |
|           | E583GW003  | 583GW00303 | 11/05/1996     | 51.9          | =         |     |                             |                         |
|           | E583GW002  | 583GW00203 | 11/05/1996     | 14.7          | J         |     |                             |                         |
|           | E583GW003  | 583GW00304 | 01/16/1997     | 47.5          | =         |     |                             |                         |
|           | E583GW001  | 583GW00104 | 01/16/1997     | 65.3          | =         |     |                             |                         |
|           | E583GW002  | 583GW00204 | 01/16/1997     | 11.1          | J         |     |                             |                         |
| Mercury   | E583GW002  | 583GW00203 | 11/05/1996     | 0.73          | =         | 2   | NA                          | 0.14 - 0.6              |
| Nickel    | E583GW001  | 583GW00103 | 11/04/1996     | 3.6           | J         | NA  | 73                          | 0.9 - 17                |
|           | E583GW001  | 583GW00104 | 01/16/1997     | 25.6          | J         |     |                             |                         |
| Potassium | E583GW003  | 583GW00301 | 03/26/1996     | 27,400        | =         | NA  | EN                          | 1,320 - 289,000         |
|           | E583GW001  | 583GW00102 | 07/16/1996     | 3,540         | J         |     |                             |                         |
|           | E583GW003  | 583GW00302 | 07/17/1996     | 31,000        | =         |     |                             |                         |
|           | E583GW001  | 583GW00103 | 11/04/1996     | 4,220         | J         |     |                             |                         |



**TABLE 5-6**  
 Compounds Detected in Shallow Groundwater (Sampling Events 2 through 4)  
 RFI Report Addendum, AOC 583, Charleston Naval Complex, Zone E

| Chemical    | Station ID | Sample ID  | Date Collected | Concentration |           | MCL | EPA Region III RBC (HI=0.1) | Zone E Background Range |
|-------------|------------|------------|----------------|---------------|-----------|-----|-----------------------------|-------------------------|
|             |            |            |                | (µg/L)        | Qualifier |     |                             |                         |
| Potassium   | E583GW003  | 583GW00303 | 11/05/1996     | 36,300        | =         | NA  | EN                          | 1,320 - 289,000         |
|             | E583GW001  | 583GW00104 | 01/16/1997     | 3,550         | J         |     |                             |                         |
|             | E583GW003  | 583GW00304 | 01/16/1997     | 29,700        | =         |     |                             |                         |
| Sodium      | E583GW002  | 583GW00201 | 03/25/1996     | 66,800        | =         | NA  | EN                          | NA                      |
|             | E583GW001  | 583GW00101 | 03/25/1996     | 108,000       | =         |     |                             |                         |
|             | E583GW003  | 583GW00301 | 03/26/1996     | 129,000       | =         |     |                             |                         |
|             | E583GW001  | 583GW00102 | 07/16/1996     | 74,500        | =         |     |                             |                         |
|             | E583GW002  | 583GW00202 | 07/16/1996     | 61,700        | =         |     |                             |                         |
|             | E583GW003  | 583GW00302 | 07/17/1996     | 117,000       | =         |     |                             |                         |
|             | E583GW001  | 583GW00103 | 11/04/1996     | 112,000       | =         |     |                             |                         |
|             | E583GW003  | 583GW00303 | 11/05/1996     | 170,000       | =         |     |                             |                         |
|             | E583GW002  | 583GW00203 | 11/05/1996     | 77,400        | =         |     |                             |                         |
|             | E583GW002  | 583GW00204 | 01/16/1997     | 60,800        | =         |     |                             |                         |
|             | E583GW001  | 583GW00104 | 01/16/1997     | 92,700        | =         |     |                             |                         |
|             | E583GW003  | 583GW00304 | 01/16/1997     | 128,000       | =         |     |                             |                         |
| Thallium    | E583GW003  | 583GW00302 | 07/17/1996     | 5.4           | J         | 2   | NA                          | 3 - 6                   |
| Vanadium    | E583GW003  | 583GW00302 | 07/17/1996     | 3             | J         | NA  | 26                          | 0.6 - 26                |
|             | E583GW001  | 583GW00103 | 11/04/1996     | 0.64          | J         |     |                             |                         |
|             | E583GW001  | 583GW00104 | 01/16/1997     | 0.90          | J         |     |                             |                         |
|             | E583GW003  | 583GW00304 | 01/16/1997     | 0.93          | J         |     |                             |                         |
| Zinc        | E583GW001  | 583GW00103 | 11/04/1996     | 35.3          | =         | NA  | 1,100                       | 5 - 141                 |
|             | E583GW003  | 583GW00303 | 11/05/1996     | 11.4          | J         |     |                             |                         |
|             | E583GW002  | 583GW00203 | 11/05/1996     | 10.1          | J         |     |                             |                         |
|             | E583GW003  | 583GW00304 | 01/16/1997     | 7.5           | J         |     |                             |                         |
|             | E583GW001  | 583GW00104 | 01/16/1997     | 16.8          | J         |     |                             |                         |
| <b>VOCs</b> |            |            |                |               |           |     |                             |                         |
| Acetone     | E583GW002  | 583GW00201 | 03/25/1996     | 56.0          | J         | NA  | 61                          | NA                      |
|             | E583GW003  | 583GW00301 | 03/26/1996     | 7             | J         |     |                             |                         |

**TABLE 5-6**  
 Compounds Detected in Shallow Groundwater (Sampling Events 2 through 4)  
 RFI Report Addendum, AOC 583, Charleston Naval Complex, Zone E

| Chemical         | Station ID | Sample ID  | Date Collected | Concentration |           | MCL    | EPA Region III RBC (HI=0.1) | Zone E Background Range |
|------------------|------------|------------|----------------|---------------|-----------|--------|-----------------------------|-------------------------|
|                  |            |            |                | (µg/L)        | Qualifier |        |                             |                         |
| Carbon Disulfide | E583GW001  | 583GW00102 | 07/16/1996     | 2             | J         | NA     | 100                         | NA                      |
| Chloroform       | E583GW002  | 583GW00202 | 07/16/1996     | 14            | =         | 100    | NA                          | NA                      |
| Styrene          | E583GW003  | 583GW00302 | 07/17/1996     | 2             | J         | 100    | NA                          | NA                      |
| PCE              | E583GW001  | 583GW00102 | 07/16/1996     | 3             | J         | 5      | NA                          | NA                      |
| Toluene          | E583GW003  | 583GW00302 | 07/17/1996     | 3             | J         | 1,000  | NA                          | NA                      |
| Xylenes, Total   | E583GW003  | 583GW00302 | 07/17/1996     | 4             | J         | 10,000 | NA                          | NA                      |

All values are presented in units of micrograms per liter (µg/L).

J indicates that the compound was detected, the reported concentration is an estimated concentration.

= indicates that the compound was detected, the reported concentration is the measured concentration.

NA indicates that the information is not available or not applicable.

EN indicates that the compound is an essential nutrient.

**TABLE 5-7**  
 Compounds Detected in Deep Groundwater (Sampling Events 2 through 4)  
 RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Chemical        | Station ID | Sample ID  | Date Collected | Concentration (µg/L) | Qualifier | MCL   | EPA Region III RBC (HI=0.1) | Zone E Background Range |
|-----------------|------------|------------|----------------|----------------------|-----------|-------|-----------------------------|-------------------------|
| <b>Metals</b>   |            |            |                |                      |           |       |                             |                         |
| Arsenic         | E583GW02D  | 583GW02D01 | 03/26/1996     | 15.6                 | =         | 50    | NA                          | 3 - 132                 |
|                 | E583GW02D  | 583GW02D03 | 11/05/1996     | 16.5                 | =         |       |                             |                         |
|                 | E583GW02D  | 583GW02D04 | 01/16/1997     | 13.3                 | J         |       |                             |                         |
| Barium          | E583GW02D  | 583GW02D02 | 07/17/1996     | 40.8                 | =         | 2,000 | NA                          | 12 - 322                |
|                 | E583GW02D  | 583GW02D03 | 11/05/1996     | 48.4                 | J         |       |                             |                         |
|                 | E583GW02D  | 583GW02D04 | 01/16/1997     | 44.9                 | J         |       |                             |                         |
| Beryllium       | E583GW02D  | 583GW02D02 | 07/17/1996     | 0.55                 | J         | 4     | NA                          | 0.2 - 1.3               |
|                 | E583GW02D  | 583GW02D04 | 01/16/1997     | 0.76                 | J         |       |                             |                         |
| Calcium         | E583GW02D  | 583GW02D01 | 03/26/1996     | 93,400               | J         | NA    | EN                          | 44,400 - 391,000        |
|                 | E583GW02D  | 583GW02D02 | 07/17/1996     | 87,300               | =         |       |                             |                         |
|                 | E583GW02D  | 583GW02D03 | 11/05/1996     | 101,000              | =         |       |                             |                         |
|                 | E583GW02D  | 583GW02D04 | 01/16/1997     | 91,400               | =         |       |                             |                         |
| Chromium, Total | E583GW02D  | 583GW02D04 | 01/16/1997     | 1.8                  | J         | 100   | NA                          | 0.8 - 27                |
| Cobalt          | E583GW02D  | 583GW02D01 | 03/26/1996     | 2.2                  | J         | NA    | 220                         | 1.1 - 14                |
|                 | E583GW02D  | 583GW02D02 | 07/17/1996     | 2                    | J         |       |                             |                         |
|                 | E583GW02D  | 583GW02D03 | 11/05/1996     | 2.3                  | J         |       |                             |                         |
| Copper          | E583GW02D  | 583GW02D04 | 01/16/1997     | 1.8                  | J         | 1,300 | NA                          | 0.6 - 6                 |
| Iron            | E583GW02D  | 583GW02D02 | 07/17/1996     | 1,950                | =         | NA    | 1,100                       | 19 - 26,000             |
|                 | E583GW02D  | 583GW02D03 | 11/05/1996     | 2,240                | =         |       |                             |                         |
|                 | E583GW02D  | 583GW02D04 | 01/16/1997     | 2,000                | =         |       |                             |                         |
| Magnesium       | E583GW02D  | 583GW02D01 | 03/26/1996     | 45,600               | =         | NA    | EN                          | 3,190 - 1,370,000       |
|                 | E583GW02D  | 583GW02D02 | 07/17/1996     | 45,100               | =         |       |                             |                         |
|                 | E583GW02D  | 583GW02D03 | 11/05/1996     | 53,500               | =         |       |                             |                         |
|                 | E583GW02D  | 583GW02D04 | 01/16/1997     | 49,500               | =         |       |                             |                         |

**TABLE 5-7**  
Compounds Detected in Deep Groundwater (Sampling Events 2 through 4)  
RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Chemical       | Station ID | Sample ID  | Date Collected | Concentration (µg/L) | Qualifier | MCL    | EPA Region III RBC (HI=0.1) | Zone E Background Range |
|----------------|------------|------------|----------------|----------------------|-----------|--------|-----------------------------|-------------------------|
| Manganese      | E583GW02D  | 583GW02D01 | 03/26/1996     | 417                  | =         | NA     | 73                          | 1.3 - 1,660             |
|                | E583GW02D  | 583GW02D02 | 07/17/1996     | 380                  | =         |        |                             |                         |
|                | E583GW02D  | 583GW02D03 | 11/05/1996     | 455                  | =         |        |                             |                         |
|                | E583GW02D  | 583GW02D04 | 01/16/1997     | 421                  | =         |        |                             |                         |
| Mercury        | E583GW02D  | 583GW02D03 | 11/05/1996     | 0.48                 | =         | 2      | NA                          | 0.11 - 0.20             |
| Nickel         | E583GW02D  | 583GW02D01 | 03/26/1996     | 27.5                 | J         | NA     | 73                          | 0.8 - 46                |
|                | E583GW02D  | 583GW02D02 | 07/17/1996     | 24.9                 | J         |        |                             |                         |
| Nickel         | E583GW02D  | 583GW02D04 | 01/16/1997     | 26.1                 | J         | NA     | 73                          | 0.8 - 46                |
| Potassium      | E583GW02D  | 583GW02D01 | 03/26/1996     | 25,800               | =         | NA     | EN                          | 1,720 - 351,000         |
|                | E583GW02D  | 583GW02D02 | 07/17/1996     | 27,700               | =         |        |                             |                         |
|                | E583GW02D  | 583GW02D03 | 11/05/1996     | 29,400               | =         |        |                             |                         |
|                | E583GW02D  | 583GW02D04 | 01/16/1997     | 33,200               | =         |        |                             |                         |
| Sodium         | E583GW02D  | 583GW02D01 | 03/26/1996     | 614,000              | =         | NA     | EN                          | NA                      |
|                | E583GW02D  | 583GW02D02 | 07/17/1996     | 551,000              | =         |        |                             |                         |
|                | E583GW02D  | 583GW02D03 | 11/05/1996     | 609,000              | =         |        |                             |                         |
|                | E583GW02D  | 583GW02D04 | 01/16/1997     | 592,000              | =         |        |                             |                         |
| Thallium       | E583GW02D  | 583GW02D02 | 07/17/1996     | 5.5                  | J         | 2      | NA                          | 3 - 7                   |
| <b>VOCs</b>    |            |            |                |                      |           |        |                             |                         |
| Acetone        | E583GW02D  | 583GW02D01 | 03/26/1996     | 10                   | J         | NA     | 61                          | NA                      |
| Styrene        | E583GW02D  | 583GW02D02 | 07/17/1996     | 2                    | J         | 100    | NA                          | NA                      |
| Toluene        | E583GW02D  | 583GW02D02 | 07/17/1996     | 4                    | J         | 1,000  | NA                          | NA                      |
| Xylenes, Total | E583GW02D  | 583GW02D02 | 07/17/1996     | 6                    | =         | 10,000 | NA                          | NA                      |

All values are presented in units of micrograms per liter (µg/L).

J indicates that the compound was detected, the reported concentration is an estimated concentration.

= indicates that the compound was detected, the reported concentration is the measured concentration.

NA indicates that the information is not available or not applicable.

EN indicates that the compound is an essential nutrient.



## 6.0 Summary of Information Related to Site Closeout Issues

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### 6.1 RFI Status

The *Zone E RFI Report, Revision 0* (EnSafe, 1997) addressed SWMUs/AOCs within Zone E of the CNC, including AOC 583. In accordance with the RFI completion process, if a determination of No Further Investigation (NFI) is made upon completion of the RFI, then a site may proceed to either NFA status or to a Corrective Measures Study (CMS). The RFI report did not identify any COCs for soil or groundwater at AOC 583. The remaining subsections address the issues that the BCT agreed to evaluate prior to site closeout.

### 6.2 Presence of Inorganics in Groundwater

For the purpose of site closeout documentation, the inorganics in groundwater issue refers to the detection of several metals (primarily arsenic, thallium, and antimony) in groundwater at concentrations above the applicable MCL, preceded or followed by detections of these same metals below the MCL or below the practicable quantitation limit.

All groundwater data collected from monitoring wells during four sampling events at AOC 583 were evaluated to address this issue. The data for these samples are presented in Table 6-1. Antimony was not detected in any groundwater sample from AOC 583.

Arsenic was not detected above its MCL in any groundwater sample from the site.

Thallium was detected in two samples (583GW00302, 5.4 J  $\mu\text{g/L}$  and 583GW02D02, 5.5 J  $\mu\text{g/L}$ ) from the second sampling event at concentrations that exceed its MCL. Thallium was not detected in the previous or subsequent (two) samples collected from these same monitoring wells. The detected concentrations of thallium were all within the range of the Zone E background concentrations.

Based on this information, there are no data suggesting that these inorganic compounds are present above background concentrations. Therefore, further evaluation of this issue is not warranted.

### **6.3 Potential Linkage to SWMU 37, Investigated Sanitary Sewers at the CNC**

There are no data suggesting that there was an impact to the sanitary sewers from AOC 583. Therefore, further evaluation of this issue is not warranted.

### **6.4 Potential Linkage to AOC 699, Investigated Storm Sewers at the CNC**

COCs requiring further evaluation were not identified in soil or groundwater at AOC 583. Based on these findings, further evaluation of this issue is not warranted.

### **6.5 Potential Linkage to AOC 504, Investigated Railroad Lines at the CNC**

The nearest railroad line to AOC 583 is approximately 100 feet to the northeast and northwest of Building 236. There are no known connections between AOC 583 and the investigated railroad lines in Zone E at the CNC.

### **6.6 Potential Migration Pathways to Surface Water Bodies at the CNC**

The nearest surface water body to AOC 583 is the Cooper River, which lies approximately 150 feet east-northeast of the site. The only potential migration pathway from the site to surface water is by overland flow from stormwater runoff. The entire site is covered with buildings and pavement, which eliminates contact of surface soil with stormwater. Similarly, runoff directed to the storm sewer system, which discharges to the Cooper River, does not contact the surface soil. Since the BEQs detected in soil at AOC 583 are under concrete and asphalt pavement, no further evaluation of a potential pathway for contaminant migration by stormwater runoff is warranted.

### **6.7 Potential Contamination in Oil/Water Separators (OWSs)**

There are no OWSs associated with AOC 583. In addition, there is no reference to an OWS at the site in the *Oil Water Separator Data* report, Department of the Navy, September 2000. Therefore, further evaluation of this issue is not warranted.

## 6.8 Land Use Controls (LUCs)

No COCs were identified at AOC 583 for the unrestricted land use scenario; the site is suitable for unrestricted land use. Therefore, LUCs are not needed at this site. However, the BCT has agreed that all of Zone E will have some LUCs. At a minimum, these LUCs are expected to include restrictions against residential land use. Site-specific LUCs are also expected to be applied at sites within Zone E depending on the site-specific investigations. LUCs will be applied to limit the reuse of this site to non-residential use.



**TABLE 6-1**  
Antimony, Arsenic, and Thallium in Groundwater  
RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Station ID | Sample ID  | Date Collected            | Antimony      |           | Arsenic        |           | Thallium      |           |
|------------|------------|---------------------------|---------------|-----------|----------------|-----------|---------------|-----------|
|            |            |                           | Result (µg/L) | Qualifier | Result (µg/L)  | Qualifier | Result (µg/L) | Qualifier |
|            |            | <b>MCL</b>                | <b>6</b>      |           | <b>50</b>      |           | <b>2</b>      |           |
|            |            | <b>Shallow Background</b> | <b>2 - 5</b>  |           | <b>3 - 316</b> |           | <b>3 - 6</b>  |           |
|            |            | <b>Deep Background</b>    | <b>3 - 7</b>  |           | <b>3 - 132</b> |           | <b>3 - 7</b>  |           |
| E583GW001  | 583GW00101 | 03/25/1996                | 4.0           | U         | 5.0            | U         | 5.0           | U         |
|            | 583GW00102 | 07/16/1996                | 2.1           | U         | 4.1            | U         | 2.7           | UJ        |
|            | 583GW00103 | 11/04/1996                | 2.1           | U         | 2.5            | U         | 2.7           | UJ        |
|            | 583GW00104 | 01/16/1997                | 2.1           | U         | 2.5            | UJ        | 2.7           | U         |
| E583GW002  | 583GW00201 | 03/25/1996                | 4.0           | U         | 5.0            | U         | 5.0           | U         |
|            | 583GW00202 | 07/16/1996                | 2.1           | U         | 2.8            | U         | 2.7           | UJ        |
|            | 583GW00203 | 11/05/1996                | 2.1           | U         | 2.5            | U         | 7.0           | U         |
|            | 583GW00204 | 01/16/1997                | 2.1           | U         | 2.9            | J         | 2.7           | U         |
| E583GW003  | 583GW00301 | 03/26/1996                | 4.0           | U         | 5.0            | U         | 5.0           | U         |
|            | 583GW00302 | 07/17/1996                | 2.3           | U         | 2.5            | U         | <b>5.4</b>    | J         |
|            | 583GW00303 | 11/05/1996                | 2.1           | U         | 2.5            | U         | 2.7           | U         |
|            | 583GW00304 | 01/16/1997                | 2.1           | U         | 2.5            | UJ        | 2.7           | U         |
| E583GW02D  | 583GW02D01 | 03/26/1996                | 4.0           | U         | 15.6           | =         | 5.0           | U         |
|            | 583GW02D02 | 07/17/1996                | 2.1           | U         | 15.3           | U         | <b>5.5</b>    | J         |
| E583GW02D  | 583GW02D03 | 11/05/1996                | 2.1           | U         | 16.5           | =         | 5.6           | U         |
|            | 583GW02D04 | 01/16/1997                | 2.1           | U         | 13.3           | J         | 2.7           | U         |

All values are presented in units of micrograms per liter (µg/L).

U indicates that the compound was not detected, the reported concentration is the detection limit.

UJ indicates that the compound was not detected, the reported concentration is an estimated detection limit.

J indicates that the compound was detected, the reported concentration is an estimated concentration.

= indicates that the compound was detected, the reported concentration is the measured concentration.

**Bold values are exceedances of the MCL.**



## 7.0 Recommendations

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AOC 583 consists of an area in the northeast corner of Building 236. Building 236 is located on Dry Dock Avenue adjacent to the south side of Dry Dock No. 5 in Zone E of the CNC. Building 583 was constructed in 1982 and improved in 1991. The north side of the building contains conference rooms, offices, a locker room, and a pipe fitting shop. The shop area contained a freon recycling and distillation unit, associated piping, and USTs. Nine USTs were present at Building 236. Two USTs contained freon, two USTs were unregulated and contained water, and five USTs contained petroleum products. The USTs were located outside the northeast corner of the building. All nine USTs were removed in 1995. Building 236 is currently being used by Deytons Shipyard, Inc., as an operations center for the shipyard area. The CNC RCRA Permit identified AOC 583 as requiring a RFI.

The *Zone E RFI Report, Revision 0* (EnSafe, 1997) identified BEQs as COCs for subsurface soil at AOC 583. Based on an evaluation of the RFI data against current screening criteria adopted by the CNC BCT, and site conditions as discussed above, no COCs were identified for the unrestricted future land use scenario. Therefore, AOC 583 is suitable for future unrestricted land use and no further corrective action is needed for this site. Therefore, AOC 583 is recommended for NFA status in the RCRA Corrective Action Plan Permit for the CNC.

Provided that the information presented in this report is adequate to address RFI completion and site closeout issues, it is expected that the BCT will concur that NFA is appropriate for AOC 583. After BCT concurrence for NFA, a Statement of Basis will be prepared and made available for public comment to allow for public participation in the final remedy selection, in accordance with SCDHEC policy.



## 8.0 References

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- Albrecht & Associates. *Underground Storage Tank Assessment Report*, GWPD#N-10-GF-16459, Building 236 – Charleston Naval Shipyard. January 2, 1996.
- CH2M-Jones. *Background PAHs Study Report – Technical Information for Development of Background BEQ Values*. Charleston Naval Complex, North Charleston, South Carolina. February 2001.
- EnSafe Inc. *Zone E RFI Report, Revision 0*, NAVBASE Charleston. 1997.
- EnSafe Inc./Allen & Hoshall. *Final RCRA Facility Assessment*, NAVBASE Charleston. July 1995.
- EnSafe Inc./Allen & Hoshall. *Final Zone E RFI Work Plan, Revision 1*, NAVBASE Charleston. June 2, 1995.
- EnSafe Inc. *Technical Memorandum: A Comprehensive Review of Common Laboratory Artifacts Detected in Environmental Samples from the Charleston Naval Base*. February 9, 1998.
- U.S. Environmental Protection Agency (EPA). 1996a. *Soil Screening Guidance: User's Guide*. Office of Solid Waste and Emergency Response (OSWER). April 1996a.
- U.S. Environmental Protection Agency (EPA). *Soil Screening Guidance: Technical Background Document*. Office of Solid Waste and Emergency Response (OSWER). May 1996b.
- South Carolina Department of Health and Environmental Control, Final RCRA Part B Permit No. SC0 170 022 560.



**Responses To Comments from Charles B. Watson — SCDHEC  
for Draft Zone E RCRA Facility Investigation Report  
Charleston Naval Complex**

**Site-Specific Comment**

**AOC 583**

**SCDHEC Comment 23:**

N-Nitroso-di-n-propylamine and pentachlorophenol were detected at concentrations above their respective SSLs and should be confirmed by resampling as part of the RFI.

**EnSafe/Navy Response 23:**

Additional sampling will be conducted in the area of 583SB006 to confirm the presence of these two compounds and assure that the site has been delineated.

**CH2M-Jones Response 23:**

*N-Nitroso-di-n-propylamine (47micrograms per kilogram [µg/kg]) and pentachlorophenol (59 µg/kg) were detected at concentrations above their respective generic SSLs (DAF=10, 0.025 µg/kg and 15 µg/kg, respectively) in a single surface soil sample (583SB00601). Neither compound was detected in the subsurface sample collected at the same location, indicating that existing concentrations are adequately attenuated with depth. Additionally, neither compound was detected in groundwater, further indicating that existing concentrations of n-nitroso-di-n-propylamine and pentachlorophenol do not represent a leaching hazard at the site. The detected concentrations of both compounds are also below their respective industrial RBCs (820 µg/kg and 48,000 µg/kg). Based on this information, further sampling is not warranted.*

**Responses To Comments from Eric F. Cathcart — SCDHEC  
for Draft Zone E RCRA Facility Investigation Report  
Charleston Naval Complex**

**Site-Specific Comments**

**AOC 583**

**SCDHEC Comment 64:**

The following SVOCs exceeded their industrial RBCs in the lower soil interval in addition to Benzo(a)pyrene and chrysene:

|                         | <u>Value</u> | <u>RBC</u> |
|-------------------------|--------------|------------|
| B(a)P Equivalent        | 5,990        | 780        |
| Benzo(a) Pyrene         | 3,700        | 780        |
| Dibenzo(a,h) anthracene | 1,300        | 780        |

The second paragraph on page 10.41-10 should be revised to include the above.

**EnSafe/Navy Response 64:**

Lower-interval soil samples were not compared to RBCs, but instead were compared to soil screening levels (SSLs) for groundwater protection. Based on the comparisons to SSLs, BEQs, benzo(a)anthracene, and chrysene exceeded their respective SSLs, as stated in the text on page 10.41-10.

**CH2M-Jones Response 64:**

*In addition to the EnSafe/Navy response to this comment, it should be noted that while both compounds exceeded the very conservative screening criteria (generic SSLs based on a DAF of 10) of the Zone E RFI Report, neither of these two PAHs were detected in groundwater at the site, indicating that the existing soil concentrations are sufficiently protective of shallow groundwater.*

**SCDHEC Comment 65:**

The report should provide the exact locations of all USTs on the site and update the site map.

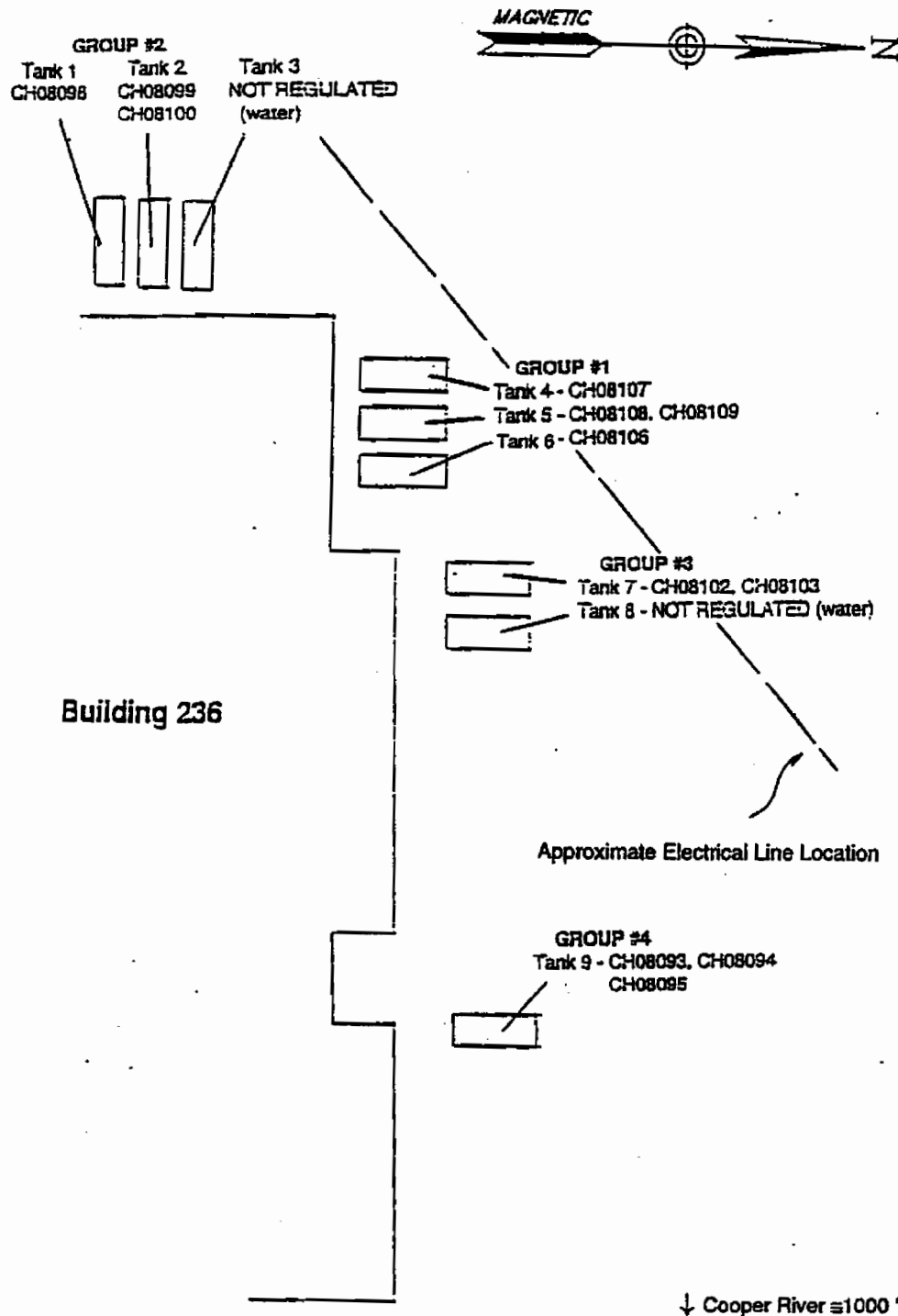
**EnSafe/Navy Response 65:**

An attempt will be made to identify the exact locations of the USTs and figures will be revised for AOC 583 to include these locations in the Final Zone E RFI Report.

**CH2M-Jones Response 65:**

*The former locations of the USTs at this site were presented in the Underground Storage Tank Assessment Report for Building 236 (Albrecht & Associates, 1996). The figure showing the former UST locations from that report is attached. The USTs were removed in August 1995.*





#### NOTES

- (1) Sample CH08095 was the only groundwater sample collected.
- (2) Sample CH08094 was collected from the trench wall at a depth of 3'-4' in a discolored area.
- (3) All other soil samples were taken from beneath the tanks. Approximately 7 feet below grade.

DESIGNED BY: ELW  
 DRAWN BY: ELW  
 APPROVED BY: JHA  
 DATE: 12/95  
 A&A JOB#: 95-923  
 FIGURE: 02  
 SCALE: NTS



UST & SAMPLE LOCATIONS  
 Building 236  
 Charleston Naval Shipyard  
 Charleston, SC



Second-round samples at AOC 583 were submitted for analysis of VOCs, SVOCs, and metals. No duplicate samples were collected during the second round of sampling. Table 10.41.1.2 summarizes the second round of soil sampling at AOC 583.

**Table 10.41.1.2**  
**AOC 583**  
**Second Round Soil Sampling Summary**

| Interval | Samples Proposed | Samples Collected | Analyses Proposed     | Analyses Collected                        | Deviations  |
|----------|------------------|-------------------|-----------------------|---|---|
| Upper    | 3                | 2                 | VOC, SVOC, and metals | VOC, SVOC, pesticide, cyanide, and metals | One sample could not be collected due to surface obstructions; one sample inadvertently analyzed for pesticides and cyanide                 |
| Lower    | 3                | 1                 | VOC, SVOC, and metals | VOC, SVOC, pesticide, cyanide, and metals | Two samples could not be collected due to surface and subsurface obstructions; one sample inadvertently analyzed for pesticides and cyanide |

#### 10.41.2 Nature of Contamination in Soil

Organic compound analytical results for soil are summarized in Table 10.41.2.1. Inorganic analytical results for soil are summarized in Table 10.41.2.2. Appendix H contains the complete data report for all samples collected in Zone E.

**Table 10.41.2.1**  
**AOC 583**  
**Organic Compounds Detected in Soil**

| Compound            | Sampling Interval | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Industrial RBC | Number of Samples Exceeding RBC |
|---------------------|-------------------|--------------------|-------------------------|------------------------|----------------|---------------------------------|
| <b>VOCs (µg/kg)</b> |                   |                    |                         |                        |                |                                 |
| Acetone             | Upper             | 2/8                | 82.0 - 93.0             | 87.5                   | 20,000,000     | 0                               |
|                     | Lower             | 4/8                | 24.0 - 110              | 60.0                   | NA             | NA                              |

Table 10.41.2.1  
AOC 583  
Organic Compounds Detected in Soil

| Compound                                   | Sampling Interval | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Industrial RBC | Number of Samples Exceeding RBC |
|--|-------------------|--------------------|-------------------------|------------------------|----------------|---------------------------------|
| <b>VOCs (<math>\mu\text{g/kg}</math>)</b>  |                   |                    |                         |                        |                |                                 |
| Carbon disulfide                           | Lower             | 1/8                | 33.0                    | 33.0                   | NA             | NA                              |
| Methylene chloride                         | Upper             | 4/8                | 2.00 - 28.0             | 15.3                   | 760,000        | 0                               |
|  | Lower             | 5/8                | 2.00 - 37.0             | 14.8                   | NA             | NA                              |
| 1,2,4-Trichlorobenzene                     | Upper             | 1/9                | 38.0                    | 38.0                   | 2,000,000      | 0                               |
| <b>SVOCs (<math>\mu\text{g/kg}</math>)</b> |                   |                    |                         |                        |                |                                 |
| Accenaphthene                              | Upper             | 1/9                | 160                     | 160                    | 12,000,000     | 0                               |
|  | Lower             | 1/8                | 89.0                    | 89.0                   | NA             | NA                              |
| Anthracene                                 | Upper             | 2/9                | 79.0 - 110              | 94.5                   | 61,000,000     | 0                               |
|  | Lower             | 2/8                | 45.0 - 500              | 273                    | NA             | NA                              |
| Benzo(g,h,i)perylene                       | Upper             | 5/9                | 46.0 - 220              | 110                    | 8,200,000      | 0                               |
|  | Lower             | 3/8                | 47.0 - 2,600            | 912                    | NA             | NA                              |
| Benzoic acid                               | Upper             | 4/9                | 64.0 - 210              | 110                    | 100,000,000    | 0                               |
|  | Lower             | 5/8                | 85.0 - 420              | 268                    | NA             | NA                              |
| bis(2-Ethylhexyl)phthalate                 | Upper             | 1/9                | 40.0                    | 40.0                   | 410,000        | 0                               |
|  | Lower             | 1/8                | 38.0                    | 38.0                   | NA             | NA                              |
| Carbazole                                  | Upper             | 1/1                | 82.0                    | 82.0                   | 290,000        | 0                               |
| Dibenzofuran                               | Lower             | 1/8                | 59.0                    | 59.0                   | NA             | NA                              |
| Diethylphthalate                           | Lower             | 1/8                | 42.0                    | 42.0                   | NA             | NA                              |
| Fluoranthene                               | Upper             | 6/9                | 56.0 - 800              | 313                    | 8,200,000      | 0                               |
|  | Lower             | 3/8                | 210 - 3,400             | 1,300                  | NA             | NA                              |
| Fluorene                                   | Upper             | 1/9                | 71.0                    | 71.0                   | 8,200,000      | 0                               |
|  | Lower             | 1/8                | 180                     | 180                    | NA             | NA                              |
| 4-Methylphenol (p-Cresol)                  | Lower             | 1/8                | 51.0                    | 51.0                   | NA             | NA                              |

Table 10.41.2.1  
AOC 583  
Organic Compounds Detected in Soil

| Compound  | Sampling Interval | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Industrial RBC | Number of Samples Exceeding RBC |
|---|-------------------|--------------------|-------------------------|------------------------|----------------|---------------------------------|
| <b>SVOCs (<math>\mu\text{g}/\text{kg}</math>)</b>                     |                   |                    |                         |                        |                |                                 |
| Naphthalene   | Upper             | 1/9                | 58.0                    | 58.0                   | 8,200,000      | 0                               |
| 4-Nitrophenol   | Upper             | 1/9                | 55.0                    | 55.0                   | 13,000,000     | 0                               |
| N-Nitroso-di-n-propylamine  | Upper             | 1/9                | 47.0                    | 47.0                   | 820            | 0                               |
| Pentachlorophenol   | Upper             | 1/9                | 59.0                    | 59.0                   | 48,000         | 0                               |
| Phenanthrene  | Upper             | 5/9                | 65.0 - 680              | 270                    | 8,200,000      | 0                               |
|   | Lower             | 3/8                | 140 - 1,700             | 690                    | NA             | NA                              |
| Pyrene  | Upper             | 5/9                | 150 - 740               | 402                    | 6,100,000      | 0                               |
|   | Lower             | 3/8                | 230 - 6,400             | 2,330                  | NA             | NA                              |
| <b>SVOCs (B(a)P Equivalents) (<math>\mu\text{g}/\text{kg}</math>)</b> |                   |                    |                         |                        |                |                                 |
| B(a)P Equiv.  | Upper             | 5/9                | 101 - 469               | 250                    | 780            | 0                               |
|   | Lower             | 3/8                | 118 - 5,990             | 2,110                  | NA             | NA                              |
| Benzo(a)anthracene  | Upper             | 5/9                | 75.0 - 260              | 162                    | 7,800          | 0                               |
|   | Lower             | 3/8                | 96.0 - 4,100            | 1,450                  | NA             | NA                              |
| Benzo(b)fluoranthene  | Upper             | 5/9                | 77.0 - 290              | 167                    | 7,800          | 0                               |
|   | Lower             | 3/8                | 97.0 - 3,300            | 1,170                  | NA             | NA                              |
| Benzo(k)fluoranthene  | Upper             | 5/9                | 94.0 - 310              | 177                    | 78,000         | 0                               |
|   | Lower             | 3/8                | 100 - 3,000             | 1,080                  | NA             | NA                              |
| Benzo(a)pyrene  | Upper             | 5/9                | 81.0 - 300              | 170                    | 780            | 0                               |
|   | Lower             | 3/8                | 93.0 - 3,700            | 1,310                  | NA             | NA                              |
| Chrysene  | Upper             | 5/9                | 98.0 - 340              | 216                    | 780,000        | 0                               |
|   | Lower             | 3/8                | 130 - 4,400             | 1,580                  | NA             | NA                              |
| Dibenz(a,h)anthracene   | Upper             | 3/9                | 40.0 - 95.0             | 61.0                   | 780            | 0                               |
|   | Lower             | 2/8                | 47.0 - 1,300            | 674                    | NA             | NA                              |

Table 10.41.2.1  
AOC 583  
Organic Compounds Detected in Soil

| Compound  | Sampling Interval | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Industrial RBC | Number of Samples Exceeding RBC |
|---|-------------------|--------------------|-------------------------|------------------------|----------------|---------------------------------|
| <b>SVOCs (B(a)P Equivalents) (<math>\mu\text{g}/\text{kg}</math>)</b> |                   |                    |                         |                        |                |                                 |
| Indeno(1,2,3-cd)pyrene  | Upper             | 5/9                | 40.0 - 160              | 86.2                   | 7,800          | 0                               |
|   | Lower             | 3/8                | 42.0 - 2,200            | 769                    | NA             | NA                              |
| <b>Pesticides/PCBs (<math>\mu\text{g}/\text{kg}</math>)</b>           |                   |                    |                         |                        |                |                                 |
| 4,4'-DDE  | Lower             | 1/1                | 3.90                    | 3.90                   | NA             | NA                              |
| <b>Dioxins (ng/kg)</b>  |                   |                    |                         |                        |                |                                 |
| Dioxin Equiv.   | Upper             | 1/1                | 0.309                   | 0.309                  | 1,000          | 0                               |
| 1234678-HpCDD   | Upper             | 1/1                | 11.6                    | 11.6                   | NA             | NA                              |
| 1234678-HpCDF   | Upper             | 1/1                | 3.32                    | 3.32                   | NA             | NA                              |
| OCDD  | Upper             | 1/1                | 151                     | 151                    | NA             | NA                              |
| OCDF  | Upper             | 1/1                | 8.17                    | 8.17                   | NA             | NA                              |

**Notes:**

$\mu\text{g}/\text{kg}$  = Micrograms per kilogram  
 ng/kg = Nanograms per kilogram  
 RBC = Risk-based concentration  
 NA = No industrial RBC established

Table 10.41.2.2  
AOC 583  
Inorganic Detections for Soil (mg/kg)

| Element       | Sample Interval | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Industrial RBC | Reference Conc. | Number of Samples Exceeding RBC and RC |
|---------------|-----------------|--------------------|-------------------------|------------------------|----------------|-----------------|--|
| Aluminum (Al) | Upper           | 9/9                | 3,740 - 14,000          | 6,700                  | 100,000        | 26,600          | 0                                      |
|               | Lower           | 8/8                | 1,590 - 16,200          | 7,990                  | NA             | 41,100          | NA                                     |
| Antimony (Sb) | Upper           | 4/9                | 0.440 - 3.50            | 1.35                   | 82.0           | 1.77            | 0                                      |
|               | Lower           | 3/8                | 0.690 - 3.90            | 1.80                   | NA             | 1.60            | NA                                     |

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Table 10.41.2.2  
AOC 583  
Inorganic Detections for Soil (mg/kg)

| Element        | Sample Interval | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Industrial RBC | Reference Conc. | Number of Samples Exceeding RBC and RC |
|----------------|-----------------|--------------------|-------------------------|------------------------|----------------|-----------------|--|
| Arsenic (As)   | Upper           | 9/9                | 0.760 - 5.10            | 3.27                   | 3.80           | 23.9            | 0                                      |
|                | Lower           | 7/8                | 4.10 - 9.50             | 6.90                   | NA             | 19.9            | NA                                     |
| Barium (Ba)    | Upper           | 9/9                | 14.2 - 33.2             | 21.2                   | 14,000         | 130             | 0                                      |
|                | Lower           | 8/8                | 3.90 - 41.9             | 24.2                   | NA             | 94.1            | NA                                     |
| Beryllium (Be) | Upper           | 9/9                | 0.150 - 0.440           | 0.294                  | 1              | 1.70            | 0                                      |
|                | Lower           | 7/8                | 0.210 - 0.760           | 0.429                  | NA             | 2.71            | NA                                     |
| Cadmium (Cd)   | Upper           | 3/9                | 0.110 - 0.170           | 0.130                  | 100            | 1.50            | 0                                      |
| Calcium (Ca)   | Upper           | 9/9                | 6,110 - 26,400          | 16,100                 | NA             | NA              | NA                                     |
|                | Lower           | 8/8                | 301 - 16,700            | 7,270                  | NA             | NA              | NA                                     |
| Chromium (Cr)  | Upper           | 9/9                | 9.80 - 179              | 56.2                   | 1,000          | 94.6            | 0                                      |
|                | Lower           | 8/8                | 2.10 - 34.7             | 19.0                   | NA             | 75.2            | NA                                     |
| Cobalt (Co)    | Upper           | 9/9                | 1.000 - 3.80            | 2.03                   | 12,000         | 19.0            | 0                                      |
|                | Lower           | 8/8                | 0.270 - 4.40            | 2.11                   | NA             | 14.9            | NA                                     |
| Copper (Cu)    | Upper           | 9/9                | 2.20 - 22.8             | 14.2                   | 8,200          | 66.0            | 0                                      |
|                | Lower           | 8/8                | 0.480 - 14.3            | 5.04                   | NA             | 152             | NA                                     |
| Iron (Fe)      | Upper           | 9/9                | 2,230 - 12,000          | 5,790                  | 61,000         | NA              | 0                                      |
|                | Lower           | 8/8                | 752 - 31,100            | 13,800                 | NA             | NA              | NA                                     |
| Lead (Pb)      | Upper           | 9/9                | 5.00 - 39.8             | 23.2                   | 1,300          | 265             | 0                                      |
|                | Lower           | 8/8                | 1.60 - 41.9             | 15.5 <i>ok</i>         | NA             | 173             | NA                                     |
| Magnesium (Mg) | Upper           | 9/9                | 460 - 3,130             | 1,960                  | NA             | NA              | NA                                     |
|                | Lower           | 8/8                | 115 - 1,980             | 1,340                  | NA             | NA              | NA                                     |

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Table 10.41.2.2  
AOC 583  
Inorganic Detections for Soil (mg/kg)

| Element        | Sample Interval | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Industrial RBC | Reference Conc. | Number of Samples Exceeding RBC and RC |
|----------------|-----------------|--------------------|-------------------------|------------------------|----------------|-----------------|--|
| Manganese (Mn) | Upper           | 9/9                | 22.1 - 238              | 94.7                   | 4,700          | 302             | 0                                      |
|                | Lower           | 8/8                | 3.70 - 153              | 69.0                   | NA             | 881             | NA                                     |
| Mercury (Hg)   | Upper           | 7/9                | 0.0200 - 0.1000         | 0.0614                 | 61             | 2.60            | 0                                      |
|                | Lower           | 4/8                | 0.0300 - 0.120          | 0.0750                 | NA             | 1.59            | NA                                     |
| Nickel (Ni)    | Upper           | 9/9                | 2.20 - 7.80             | 5.11                   | 4,100          | 77.1            | 0                                      |
|                | Lower           | 8/8                | 0.700 - 7.70            | 4.31                   | NA             | 57.0            | NA                                     |
| Potassium (K)  | Upper           | 9/9                | 236 - 1,150             | 579                    | NA             | NA              | NA                                     |
|                | Lower           | 7/8                | 430 - 1,670             | 876                    | NA             | NA              | NA                                     |
| Selenium (Se)  | Lower           | 2/8                | 1.10 - 1.20             | 1.15                   | NA             | 2.40            | NA                                     |
| Silver (Ag)    | Lower           | 1/8                | 0.390                   | 0.390                  | NA             | NA              | NA                                     |
| Sodium (Na)    | Upper           | 7/9                | 158 - 353               | 263                    | NA             | NA              | NA                                     |
|                | Lower           | 6/8                | 174 - 402               | 297                    | NA             | NA              | NA                                     |
| Thallium (Tl)  | Lower           | 2/8                | 0.670 - 1.000           | 0.835                  | NA             | NA              | NA                                     |
| Tin (Sn)       | Upper           | 1/9                | 2.90                    | 2.90                   | 100,000        | 59.4            | 0                                      |
|                | Lower           | 1/8                | 3.00                    | 3.00                   | NA             | 9.23            | NA                                     |
| Vanadium (V)   | Upper           | 9/9                | 6.70 - 21.4             | 11.8                   | 1,400          | 94.3            | 0                                      |
|                | Lower           | 8/8                | 2.20 - 46.0             | 22.5                   | NA             | 155             | NA                                     |
| Zinc (Zn)      | Upper           | 9/9                | 7.00 - 87.8             | 47.5                   | 61,000         | 827             | 0                                      |
|                | Lower           | 8/8                | 2.10 - 52.2             | 23.9                   | NA             | 886             | NA                                     |

Notes:

mg/kg = Milligrams per kilogram  
RBC = Risk-based concentration  
RC = Reference concentration  
NA = No industrial RBC or RC established



**Table 10.41.3.1**  
**AOC 583**  
**Groundwater Sampling Summary**

| Depth   | Wells<br>Proposed | Wells<br>Installed | Analyses Proposed   | Analyses Collected  | Deviations |
|---------|-------------------|--------------------|---------------------|---------------------|------------|
| Shallow | 3                 | 3                  | VOCs, SVOCs, metals | VOCs, SVOCs, metals | None       |
| Deep    | 1                 | 1                  | VOCs, SVOCs, metals | VOCs, SVOCs, metals | None       |

The shallow monitoring wells were installed at 13.1 to 13.5 feet bgs in the surficial aquifer. The deep well was installed at 30.2 feet bgs at the base of the surficial aquifer. All wells were installed in accordance with Section 3.3 of this report.

#### 10.41.4 Nature of Contamination in Groundwater

Organic compound analytical results for shallow and deep groundwater are summarized in Tables 10.41.4.1 and 10.41.4.2, respectively. Inorganic analytical results for shallow and deep groundwater are summarized in Tables 10.41.4.3 and 10.41.4.4. Appendix H contains the complete data report for all samples collected in Zone E.

**Table 10.41.4.1**  
**AOC 583**  
**Organic Compounds Detected in First Quarter Groundwater ( $\mu\text{g/L}$ )**  
**Shallow Monitoring Wells**

| Compound    | Freq. of<br>Detection | Range of<br>Detected<br>Conc. | Mean of<br>Detected<br>Conc. | Tap-Water<br>RBC | MCL | Number of<br>Samples<br>Exceeding<br>RBC |
|-------------|-----------------------|-------------------------------|------------------------------|------------------|-----|--|
| <b>VOCs</b> |                       |                               |                              |                  |     |  |
| Acetone     | 2/3                   | 7.00 - 56.0                   | 31.5                         | 370              | NA  | 0  |

**Notes:**

$\mu\text{g/L}$  = Micrograms per liter  
 RBC = Risk-based concentration  
 MCL = Maximum contaminant level  
 NA = No MCL established

Table 10.41.4.2  
AOC 583  
Organic Compounds Detected in First Quarter Groundwater ( $\mu\text{g/L}$ )  
Deep Monitoring Wells

| Compound    | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Tap-Water RBC | MCL | Number of Samples Exceeding RBC |
|-------------|--------------------|-------------------------|------------------------|---------------|-----|---------------------------------|
| <b>VOCs</b> |                    |                         |                        |               |     |                                 |
| Acetone     | 1/1                | 10.0                    | 10.0                   | 370           | NA  | 0                               |

**Notes:**

$\mu\text{g/L}$  = Micrograms per liter  
RBC = Risk-based concentration  
MCL = Maximum contaminant level  
NA = No MCL established

Table 10.41.4.3  
AOC 583  
Inorganics Detected in First Quarter Groundwater ( $\mu\text{g/L}$ )  
Shallow Monitoring Wells

| Element        | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Tap-Water RBC | Reference Conc. | MCL  | Number of Samples Exceeding RBC and RC |
|----------------|--------------------|-------------------------|------------------------|---------------|-----------------|------|--|
| Calcium (Ca)   | 2/3                | 65,600 - 67,700         | 66,700                 | NA            | NA              | NA   | NA                                     |
| Cobalt (Co)    | 1/3                | 3.70                    | 3.70                   | 220           | 2.5             | NA   | 0                                      |
| Lead (Pb)      | 1/3                | 5.20                    | 5.20                   | NA            | 4.8*            | 15.0 | 0                                      |
| Magnesium (Mg) | 3/3                | 4,800 - 30,000          | 14,000                 | NA            | NA              | NA   | NA                                     |
| Manganese (Mn) | 3/3                | 8.90 - 49.4             | 32.2                   | 84.0          | 2,560           | NA   | 0                                      |
| Potassium (K)  | 1/3                | 27,400                  | 27,400                 | NA            | NA              | NA   | NA                                     |
| Sodium (Na)    | 3/3                | 66,800 - 129,000        | 101,000                | NA            | NA              | NA   | NA                                     |

**Notes:**

$\mu\text{g/L}$  = Micrograms per liter  
RBC = Risk-based concentration  
MCL = Maximum contaminant level  
RC = Reference concentration  
NA = No RBC, MCL, or RC established  
\* = TTAL

Table 10.41.4.4  
AOC 583  
Inorganic Detections for First Quarter Groundwater (µg/L)  
Deep Monitoring Wells

| Element        | Freq. of Detection | Range of Detected Conc. | Mean of Detected Conc. | Tap-Water RBC | Reference Conc. | MCL  | Number of Samples Exceeding RBC and RC |
|----------------|--------------------|-------------------------|------------------------|---------------|-----------------|------|--|
| Arsenic (As)   | 1/1                | 15.6                    | 15.6                   | 0.0450        | 16.4            | 50.0 | 0                                      |
| Calcium (Ca)   | 1/1                | 93,400                  | 93,400                 | NA            | NA              | NA   | NA                                     |
| Cobalt (Co)    | 1/1                | 2.20                    | 2.20                   | 220           | 12.9            | NA   | 0                                      |
| Magnesium (Mg) | 1/1                | 45,600                  | 45,600                 | NA            | NA              | NA   | NA                                     |
| Manganese (Mn) | 1/1                | 417                     | 417                    | 84.0          | 869             | NA   | 0                                      |
| Nickel (Ni)    | 1/1                | 27.5                    | 27.5                   | 73.0          | 42.2            | 100  | 0                                      |
| Potassium (K)  | 1/1                | 25,800                  | 25,800                 | NA            | NA              | NA   | NA                                     |
| Sodium (Na)    | 1/1                | 614,000                 | 614,000                | NA            | NA              | NA   | NA                                     |

**Notes:**

µg/L = Micrograms per liter  
RBC = Risk-based concentration  
MCL = Maximum contaminant level  
RC = Reference concentration  
NA = No RBC, MCL, or RC established

## Volatile Organic Compounds in Groundwater

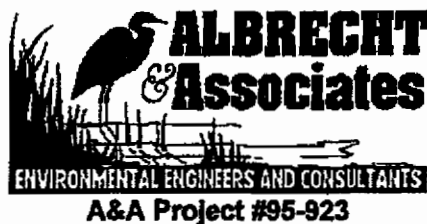
### Shallow Groundwater

One VOC was detected in two of three shallow groundwater samples collected at AOC 583. The VOC did not exceed its respective tap-water RBC.

### Deep Groundwater

One VOC was detected in the one deep groundwater sample collected at AOC 583. The VOC did not exceed its respective tap-water RBC.





**UNDERGROUND STORAGE TANK  
ASSESSMENT REPORT  
GWPD# N-10-GF-16459  
Building 236 - Charleston Naval Shipyard  
Navy RAC Project 22567-100-SC-0395**


Submitted to:

**BECHTEL ENVIRONMENTAL, INC.**  
151 LAFAYETTE DRIVE  
Oak Ridge, TN 37831  
(615) 220-2534

Prepared for:

**FENN-VAC, INC.**  
P.O. Box 62679  
North Charleston, SC 29419-2676  
(803) 552-8306

  
Prepared By:  
Eric L. White, E.I.T.  
Project Manager

  
Reviewed By:  
John H. Albrecht, P.E.  
President

January 2, 1996

South Carolina Department of Health and Environmental Control (S.C.D.H.E.C.)  
Underground Storage Tank (UST) Assessment Report

Date Received

State Use Only

Submit Completed Form To:  
UST Regulatory Section  
SCDHEC  
2600 Bull Street  
Columbia, South Carolina 29201  
Telephone (803) 734-5331

**I. OWNERSHIP OF UST(S)**

Charleston Naval Shipyard

Owner Name (Corporation, Individual, Public Agency, Other)

1351 First Street

Mailing Address

Charleston

SC

29408-2020

City

State

Zip Code

803

743-5519

Code 106.24-CNSY

Area Code

Telephone Number

Contact Person

**II. SITE IDENTIFICATION AND LOCATION**

N-10-GF-16459

Site I.D. #

Building 236 - Pipe Shop

Facility Name or Company Site Identifier

1670 Dry Dock Avenue

Street Address or State Road (as applicable)

Charleston

Charleston

City

County

**III. CLOSURE INFORMATION**

08-09-95

08-23-95

07

Closure Started

Closure Completed

Number of USTs Closed

Bechtel Environmental, Inc.

Fenn-Vac, Inc.

Consultant

UST Removal Contractor

**IV. CERTIFICATION (Read and sign after completing entire submittal.)**

I certify that I have personally examined and am familiar with the information submitted to this and all attached documents; and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Eric L. White

Name (type or print)

Signature

## V. UST INFORMATION

|   | TNK236<br>TK - 1 | TNK236<br>TK - 2 | TNK236<br>TK - 4 | TNK236<br>TK - 5 | TNK236<br>TK - 6 | TNK236<br>TK - 7   | TNK236<br>TK - 9 |
|---|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|
| A. Product.....                           | Waste<br>Oil     | Freon            | Oil              | Oil              | Oil              | Reclaimed<br>Freon | Fuel<br>Oil      |
| B. Capacity (gallons).....                | 560              | 560              | 275              | 275              | 560              | 1000               | 1000             |
| C. Age.....                               | ≈16<br>years     | ≈16<br>years     | ≈16<br>years     | ≈16<br>years     | ≈16<br>years     | ≈16<br>years       | ≈16<br>years     |
| D. Construction Material.....             | Steel            | Steel            | Steel            | Steel            | Steel            | Steel              | Steel            |
| E. Month/Year of Last Use.....            | Unknown          | Unknown          | Unknown          | Unknown          | Unknown          | Unknown            | Unknown          |
| F. Depth (ft.) to Base of Tank.....       | ≈7'              | ≈7'              | ≈7'              | ≈7'              | ≈7'              | ≈7'                | ≈7'              |
| G. Spill Prevention Equipment Y/N.....    | No               | No               | No               | No               | No               | No                 | No               |
| H. Overfill Prevention Equipment Y/N..... | No               | No               | No               | No               | No               | No                 | No               |
| I. Method of Closure Removed/Filled.....  | Removal          | Removal          | Removal          | Removal          | Removal          | Removal            | Removal          |
| J. Visible Corrosion or Pitting Y/N.....  | No               | No               | No               | No               | No               | No                 | No               |
| K. Visible Holes Y/N.....                 | No               | No               | No               | No               | No               | No                 | No               |

L. Method of disposal of any USTs removed from the ground (attach disposal manifests)

Processed through Fenn-Vac, Inc.. See Attachment II - Disposal Manifests.

M. Method of disposal for any liquid petroleum, sludges, or waste waters removed from the UST's (attach disposal manifests)

Liquid wastes from tanks and piping pumped by Navy and disposed of by standard base procedures.

Rinsate water was removed by Fenn-Vac and treated by Water Recovery Systems. See Attachment II.

N. If any corrosion, pitting, or holes were observed, describe the location and extent for each UST

None observed.

## VI. PIPING INFORMATION

| TNK236<br>TK - 1 | TNK236<br>TK - 2 | TNK236<br>TK - 4 | TNK236<br>TK - 5 | TNK236<br>TK - 6 | TNK236<br>TK - 7 | TNK236<br>TK - 9 |
|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| Steel            | Steel            | Steel            | Steel            | Steel            | Steel            | Steel            |
| ≈15'             | ≈15'             | ≈15'             | ≈15'             | ≈15'             | ≈15'             | ≈15'             |
| 1                | 1                | 1                | 1                | 1                | 1                | 1                |
| S                | S                | S                | S                | S                | S                | S                |
| No               | No               | No               | No               | No               | No               | No               |
| No               | No               | No               | No               | No               | No               | No               |
| No               | No               | No               | No               | No               | No               | No               |
| ≈16<br>years     | ≈16<br>years     | ≈16<br>years     | ≈16<br>years     | ≈16<br>years     | ≈16<br>years     | ≈16<br>years     |

- A. Construction Material.....
- B. Distance from UST to Dispenser.....
- C. Number of Dispensers.....
- D. Type of System P/S.....
- E. Was Piping Removed from the Ground? Y/N.....
- F. Visible Corrosion or Pitting Y/N.....
- G. Visible Holes Y/N.....
- H. Age.....

- I. If any corrosion, pitting or holes were observed, describe the location and extent for each line.

Exposed piping appeared in good condition. Piping was drained back into tank prior to cutting. Ends of piping capped during closure. Lengths of piping given represent approximate lengths underground. Piping runs above ground within building.

## VII. BRIEF SITE DESCRIPTION AND HISTORY

Building 236 is a pipe shop located at the Charleston Naval Shipyard. The removed USTs were used to supply operations at Building 236. Tank 3 and Tank 8 are non-regulated water USTs that were also closed by removal.



# VIII. SITE CONDITIONS

|  | Yes | No | Unk |
|--|-----|----|-----|
| <p>A. Were any petroleum-stained or contaminated soils found in the UST excavation, soil borings, trenches, or monitoring wells?</p> <p><b>Sample results report contamination in each tank group.</b></p> <p>If yes, indicate depth and location on the site map.</p> | X   |    |     |
| <p>B. Were any petroleum odors detected in the excavation, soil borings, trenches, or monitoring wells?</p> <p>If yes, indicate location on site map and describe the odor (strong, mild, etc.)</p>  |     | X  |     |
| <p>C. Was water present in the UST excavation, soil borings, or trenches?</p> <p><b>Water observed only in Tank 9 excavation at approximately 7' below grade.</b></p> <p>If yes, how far below land surface (indicate location and depth)?</p>                         | X   |    |     |
| <p>D. Did contaminated soils remain stockpiled on site after closure?</p> <p><b>Soil returned to excavation.</b></p> <p>If yes, indicated the stockpile location on the site map.</p> <p>Name of DHEC representative authorizing soil removal:</p>                     |     | X  |     |
| <p>E. Was a petroleum sheen or free product detected on any excavation or boring waters?</p> <p>If yes, indicated location and thickness</p>   |     | X  |     |

## IX. SAMPLE INFORMATION

S.C.D.H.E.C. Lab Certification Number 10120

B.

| Sample # | Location                 | Sample Type<br>(Soil/Water) | Depth*  | Date/Time of<br>Collection | Collected<br>by | OVA<br>Result |
|----------|--------------------------|-----------------------------|---------|----------------------------|-----------------|---------------|
| CH08098  | Tank 1 Basin - Center    | Soil                        | 7'      | 8/14/95 - 11:45            | Joe Duncan      | 15            |
| CH08099  | Tank 2 Basin - East End  | Soil                        | 7'      | 8/14/95 - 15:20            | Joe Duncan      | 10            |
| CH08100  | Tank 2 Basin - West End  | Soil                        | 7'      | 8/14/95 - 15:25            | Joe Duncan      | 5             |
| CH08107  | Tank 4 Basin - Center    | Soil                        | 7'      | 8/17/95 - 09:21            | Joe Duncan      | 3             |
| CH08109  | Tank 4 Basin - South End | Soil                        | 7'      | 8/17/95 - 09:29            | Joe Duncan      | 10            |
| CH08108  | Tank 5 Basin - Center    | Soil                        | 7'      | 8/17/95 - 09:24            | Joe Duncan      | 5             |
| CH08106  | Tank 6 Basin - Center    | Soil                        | 7'      | 8/16/95 - 13:25            | Joe Duncan      | 10            |
| CH08102  | Tank 7 Basin - North End | Soil                        | 7'      | 8/15/95 - 14:56            | Joe Duncan      | 70            |
| CH08103  | Tank 7 Basin - South End | Soil                        | 7'      | 8/15/95 - 15:03            | Joe Duncan      | 10            |
| CH08093  | Tank 9 Basin - Center    | Soil                        | 7'      | 8/10/95 - 17:35            | Joe Duncan      | 30            |
| CH08094  | Tank 9 Basin - Sidewall  | Soil                        | 3' - 4' | 8/10/95 - 17:30            | Joe Duncan      | 30            |
| CH08095  | Tank 9 Basin             | Water                       | 7' - 8' | 8/10/95 - 17:25            | Joe Duncan      | NA            |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |
|          |                          |                             |         |                            |                 |               |

\* = Depth Below the Surrounding Land Surface

\*\* = Submitted for Laboratory Analysis

\*\*\* = Not Depicted on Figure 2

NA = Not Analyzed

## **X. SAMPLING METHODOLOGY**

Provide a detailed description of the methods used to collect and store (preserve) the samples. Please use the space provided below.

**STAINLESS STEEL SAMPLING EQUIPMENT USED TO COLLECT SAMPLES. ALL SAMPLING EQUIPMENT WAS DECONTAMINATED PRIOR TO AND IN BETWEEN EACH COLLECTION BY AN ALCONOX DETERGENT WASH, DOUBLE RINSE WITH TAP WATER, ISOPROPANOL RINSE AND ORGANIC-FREE WATER RINSE.**

**ALL SAMPLES WERE PACKAGED IN LABORATORY SUPPLIED CONTAINERS AND IMMEDIATELY PLACED ON ICE. SAMPLES WERE THEN DELIVERED UNDER PROPER CHAIN OF CUSTODY TO GENERAL ENGINEERING LABORATORIES IN CHARLESTON , SOUTH CAROLINA.**

## XI. RECEPTORS

|  | Yes      | No       |
|--|----------|----------|
| <p>Are there any lakes, ponds, streams, or wetlands located within 1000 feet of the UST system?</p> <p><b>Cooper River approximately 1000 feet to the east.</b></p> <p>If yes, indicated type of receptor, distance, and direction on site map.</p>  | <b>X</b> |          |
| <p>B. Are there any public, private, or irrigation water supply wells within 1000 feet of the UST system?</p> <p>If yes, indicate type of well, distance, and direction on site map.</p>   |          | <b>X</b> |
| <p>C. Are there any underground structures (e.g., basements) located within 100 feet of the UST system?</p> <p>If yes, indicate the type of structure, distance, and direction on site map.</p>  |          | <b>X</b> |
| <p>D. Are there any underground utilities (e.g., telephone, electricity, gas, water, sewer, storm drain) located within 100 feet of the UST system that could potentially come in contact with the contamination? <b>Electrical lines run by Northeast corner of Building 236.</b></p> <p>If yes, indicate the type of utility, distance, and direction on the site map.</p> | <b>X</b> |          |
| <p>E. Has contaminated soil been identified at a depth less than 3 feet below land surface in an area that is not capped by asphalt or concrete?</p> <p>If yes, indicate the area of contaminated soil on the site map.</p>  |          | <b>X</b> |

**ATTACHMENT I**

**FIGURES**



GROUP #2  
 Tank 1  
 CH08098  
 Tank 2  
 CH08099  
 CH08100  
 Tank 3  
 NOT REGULATED  
 (water)



Building 236

GROUP #1  
 Tank 4 - CH08107  
 Tank 5 - CH08108, CH08109  
 Tank 6 - CH08106

GROUP #3  
 Tank 7 - CH08102, CH08103  
 Tank 8 - NOT REGULATED (water)

Approximate Electrical Line Location

GROUP #4  
 Tank 9 - CH08093, CH08094  
 CH08095

↓ Cooper River ≈ 1000' to the east

#### NOTES

- (1) Sample CH08095 was the only groundwater sample collected.
- (2) Sample CH08094 was collected from the trench wall at a depth of 3'-4' in a discolored area.
- (3) All other soil samples were taken from beneath the tanks. Approximately 7 feet below grade.

DESIGNED BY: ELW  
 DRAWN BY: ELW  
 APPROVED BY: JHA  
 DATE: 12/95  
 A&A JOB#: 95-923  
 FIGURE: 02  
 SCALE: NTS



UST & SAMPLE LOCATIONS  
 Building 236  
 Charleston Naval Shipyard  
 Charleston, SC





**ATTACHMENT II**  
**DISPOSAL MANIFESTS**

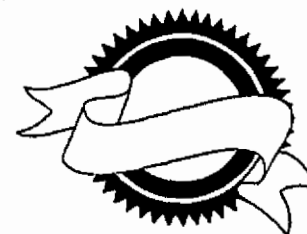
**FENNELL CONTAINER CO., INC.**

TOTAL WASTE MANAGEMENT SERVICES

P. O. Box 62679

North Charleston, SC 29419-2679

(803) 552-4751 - Fax (803) 760-0448



***This Certificate Is Hereby Issued To:***

Navy-RAC 22567 Charleston Naval Shipyard

to document that Tank 1 Carbon Steel Contaminated Oil 42" dia. X 7' 9" belonging to said certificate holder were received and processed through

FENNELL CONTAINER CO., INC. TRANSFER &  
PROCESSING FACILITY - PERMIT #182441-2001  
141 FENNELL RD.  
N. CHARLESTON, SC 29418

Destruction was completed in compliance with all applicable rules and regulations set forth by state and federal authorities and the facility permit.

08-31-95

Date

  
Signature

V.P. Operations  
Title

22567-100-SC-0395

Project No.

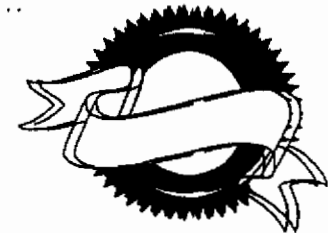
**FENNEL CONTAINER CO., INC.**

TOTAL WAREHOUSE MANAGEMENT SERVICES

P. O. Box 62679

North Charleston, SC 29419-2679

(803) 552-4751 - Fax (803) 760-0448



***This Certificate Is Hereby Issued To:***

IN Navy RAC 22567/Charleston Naval Shipyard

to document that Tank 2 Carbon Steel Breon Tank 36" dia. X 10' belonging  
to said certificate holder were received and processed through

FENNEL CONTAINER CO., INC. TRANSFER &  
PROCESSING FACILITY - PERMIT #182441-2001  
1411 FENNEL RD.  
N. CHARLESTON, SC 29418

Destruction was completed in compliance with all applicable  
rules and regulations set forth by state and federal authorities  
and the facility permit.

08-31-95

Date

  
Signature

W.B. Operation

Title

22567-100-SC-0895

Project No.

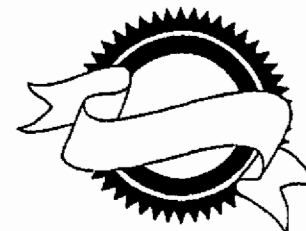
**FENNELL CONTAINER CO., INC.**

TOTAL WASTE MANAGEMENT SERVICES

P. O. Box 62679

North Charleston, SC 29419-2679

(803) 552-4751 - Fax (803) 760-0448



***This Certificate Is Hereby Issued To:***

Navy-RAC 22567 Charleston Naval Shipyard

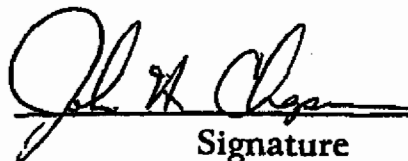
to document that Tank 4 Carbon Steel Oil and Tank 36" dia. X 5' belonging  
to said certificate holder were received and processed through

FENNELL CONTAINER CO., INC. TRANSFER &  
PROCESSING FACILITY - PERMIT #182441-2001  
141 FENNELL RD.  
N. CHARLESTON, SC 29418

Destruction was completed in compliance with all applicable  
rules and regulations set forth by state and federal authorities  
and the facility permit.

08-31-95

Date



Signature

V.P. Operator

Title

22567-100-SC-0395

Project No.

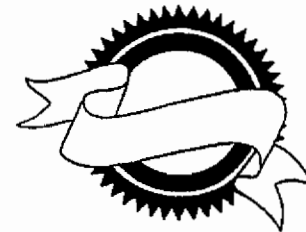
**FENNELL CONTAINER CO., INC.**

TOTAL WASTE MANAGEMENT SERVICES

P. O. Box 62679

North Charleston, SC 29419-2679

(803) 552-4751 - Fax (803) 760-0448



***This Certificate Is Hereby Issued To:***

Navy-RAC 22567 Charleston Naval Shipyard

to document that Tank 5 Carbon Steel Oil and Tank 36" dia. X 5' belonging  
to said certificate holder were received and processed through

FENNELL CONTAINER CO., INC. TRANSFER &  
PROCESSING FACILITY - PERMIT #182441-2001

141 FENNELL RD.

N. CHARLESTON, SC 29418

Destruction was completed in compliance with all applicable  
rules and regulations set forth by state and federal authorities  
and the facility permit.

08-31-95

Date

*John H. Chapp*  
Signature

*V.P. Operators*

Title

22567-100-SC-0395

Project No.

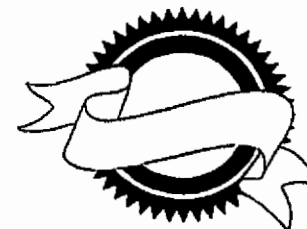
**FENNELL CONTAINER CO., INC.**

TOTAL WASTE MANAGEMENT SERVICES

P. O. Box 62679

North Charleston, SC 29419-2679

(803) 552-4751 - Fax (803) 760-0448



***This Certificate Is Hereby Issued To:***

Navy-RAC 22567 Charleston Naval Shipyard

to document that Tank 6 Carbon Steel Fuel Tank 42" dia. X 7' 9" belonging  
to said certificate holder were received and processed through

FENNELL CONTAINER CO., INC. TRANSFER &  
PROCESSING FACILITY - PERMIT #182441-2001

141 FENNELL RD.

N. CHARLESTON, SC 29418

Destruction was completed in compliance with all applicable  
rules and regulations set forth by state and federal authorities  
and the facility permit.

08-31-95

Date

*John H. Chappin*  
Signature

*V.P. Operator*  
Title

22567-100-SC-0395

Project No.

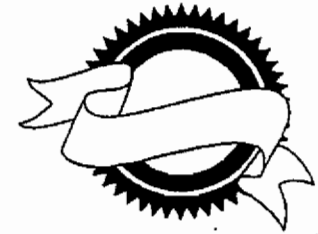
**FENNELL CONTAINER CO., INC.**

TOTAL WASTE MANAGEMENT SERVICES

P. O. Box 62679

North Charleston, SC 29419-2679

(803) 552-4751 - Fax (803) 760-0448



***This Certificate Is Hereby Issued To:***

Navy-RAC 22567 Charleston Naval Shipyard

to document that Tank 7 Carbon Steel Freon Tank 42" dia. x 16' belonging  
to said certificate holder were received and processed through

FENNELL CONTAINER CO., INC. TRANSFER &  
PROCESSING FACILITY - PERMIT #182441-2001


141 FENNELL RD.

N. CHARLESTON, SC 29418

Destruction was completed in compliance with all applicable  
rules and regulations set forth by state and federal authorities  
and the facility permit.

08-31-95

Date

  
Signature

V.P. Operations

Title

22567-100-SC-0395

Project No.

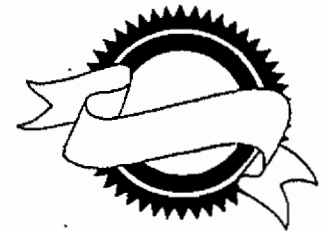
**FENNELL CONTAINER CO., INC.**

TOTAL WASTE MANAGEMENT SERVICES

P. O. Box 62679

North Charleston, SC 29419-2679

(803) 552-4751 - Fax (803) 760-0448



***This Certificate Is Hereby Issued To:***

Navy-RAC 22567 Charleston Naval Shipyard

to document that Tank 2 Stainless Steel Fuel Tank 54" dia. X 8'6" belonging  
to said certificate holder were received and processed through

FENNELL CONTAINER CO., INC. TRANSFER &

PROCESSING FACILITY - PERMIT #182441-2001

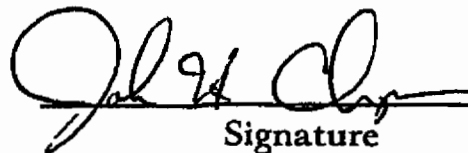
141 FENNELL RD.

N. CHARLESTON, SC 29418

Destruction was completed in compliance with all applicable  
rules and regulations set forth by state and federal authorities  
and the facility permit.

08-31-95

Date



Signature

J. P. Operato

Title

22567-100-SC-0395

Project No.



**ATTACHMENT III**

**LABORATORY RESULTS &  
CHAIN OF CUSTODY**

## Certificate of Analysis (C of A)

Certificates of Analysis (C of A's) are presented in this section. The results and data qualifiers reflected on these documents are the same as those found on CLP Form I's (presented in the Forms section).

The Certificate of Analysis contains the following headings:

|                 |  |
|-----------------|--|
| Sample ID:      | Sample description taken from chain of custody |
| Lab ID:         | This is the laboratory identification number   |
| Matrix:         | Sample matrix                                  |
| Date Collected: | Date of sample collection                      |
| Date Received:  | Date of sample receipt by the laboratory       |
| Priority:       | Internal status of sample turnaround           |
| Collector:      | Who collected the sample                       |

The detail on the Certificate includes the following:

|            |   |
|------------|---|
| Parameter: | Analyte or characteristic tested for in the sample  |
| Qualifier: | Qualifier used for data interpretation  |
| Result:    | Final result of each parameter  |
| DL:        | Detection limit   |
| RL:        | Reporting limit   |
| Units:     | Units of final result   |
| DF:        | Dilution factor   |
| Analyst:   | Initials of analyst who performed the test  |
| Date:      | Date of analysis  |
| Time:      | Time of analysis  |
| Batch:     | Analytical batch in which the sample was analyzed   |
| M:         | Analytical method used for the analysis of the sample—identified at the end of the report |
| C:         | Container number—identified at the end of the report                                      |

General Engineering Laboratories, Inc.  
Qualifier Definitions for Bechtel Level C and D

| Section           | Explanation  | Location                   |
|-------------------|--|----------------------------|
| <b>Inorganics</b> |  |                            |
| *                 | Duplicate analysis is not within control limit   | C of A, Form 1, and EDD    |
| +                 | Correlation Coefficient for the MSA is < 0.995   | C of A, Form 2, EDD        |
| B                 | Reported value is >DL and <RL  | C of A, Form 1, and EDD    |
| M                 | Duplicate Injection precision not met  | C of A, EDD                |
| S                 | Reported Method was determined by MSA  | C of A, EDD                |
| U                 | Parameter analyzed but <DL   | C of A, Form 1 and EDD     |
| W                 | Post-Dig spike for GFAA out of control limit (85% - 115%) and sample absorb is <50% spike absb | C of A, EDD, Form V part 2 |
| **                | Control Sample outside of acceptance limit   | QC Summary Report          |

**BOLD** = Manual Insertion under the "Q" Column in LIMS batch data screen . Go to the line item, tab over to the "Q". Inert the qualifier where the < was. Multiple qualifiers can be placed into the column

General Engineering Laboratories, Inc.  
Qualifier Definitions for Bechtel Level C and D

| Organics |   |                         |
|----------|---|-------------------------|
| A        | TIC is suspected Aldol Condensation Product   | C of A, Form 1, and EDD |
| C        | PEST/PCB ID has been confirmed by GC/MS   | C of A, Form 1, and EDD |
| D        | Value derived by dilution   | C of A and EDD          |
| E        | Out of Calibration Range  | C of A, Form 1, and EDD |
| J        | Value is non-zero detect and <RL  | C of A, Form 1, and EDD |
| N        | Presumptive evidence to make a tentative identification of the analyte                  | C of A, Form 1, and EDD |
| NJ       | Analyte has been tentatively identified and the associated numerical value is estimated | C of A, Form 1, and EDD |
| P        | PEST/PCB target analyte with > 25% diff   | C of A and EDD, Form 10 |
| U        | Compound analyzed but not detected  | C of A, Form 1, and EDD |
| X        | Other Flag  | C of A, Form 1, and EDD |
| B        | Compound was also detected in the method blank  | C of A, Form 1, and EDD |
| **       | Control Sample outside of acceptance limit  | QC Summary Report       |

**BOLD = Manual Insertion under the "Q" Column in LIMS batch data screen . Go to the line item, tab over to the "Q". Inert the qualifier where the < was. Multiple qualifiers can be placed into the column**

TANK 1

WASTE OIL  
GROUP #2



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EE7156/87294 | EE7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WT    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 3

Sample ID : CH08098 SBS  
Lab ID : 9508388-03  
Matrix : Soil  
Date Collected : 08/14/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |     |     |       |     |         |          |      |       |   |   |
| Trichlorotrifluoroethane                            | J         | 2      | 12  | 12  | ug/kg | 1.0 | SME     | 08/24/95 | 1944 | 71666 | 1 | 1 |
| <b>BTEX and Naphthalene - 6 items</b>               |           |        |     |     |       |     |         |          |      |       |   |   |
| Benzene   | U         | 12     | 1   | 12  | ug/kg | 1.0 | TLD     | 08/28/95 | 1105 | 71823 | 2 | N |
| Ethylbenzene  | U         | 12     | 1   | 12  | ug/kg | 1.0 |         |          |      |       |   |   |
| Methylbenzene                                       | J         | 0.7    | 1   | 12  | ug/kg | 1.0 |         |          |      |       |   |   |
| o-Xylene  | J         | 2      | 1   | 12  | ug/kg | 1.0 |         |          |      |       |   |   |
| m-xylene and para-Xylenes                           | J         | 0.8    | 1   | 12  | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene  | J         | 0.7    | 1   | 12  | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                                 |           |        |     |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            |           | 17     | 1   | 1   | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71274 | 3 | 2 |
| <b>Extractable Organics</b>                         |           |        |     |     |       |     |         |          |      |       |   |   |
| <b>Polynuclear Aromatic Hydrocarbons - 16 items</b> |           |        |     |     |       |     |         |          |      |       |   |   |
| Acenaphthene  | U         | 390    | 200 | 390 | ug/kg | 1.0 | ICB     | 08/26/95 | 0239 | 71625 | 4 | 2 |
| Acenaphthylene                                      | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Anthracene  | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(ghi)perylene                                  | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Chrysene  | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Dibenzo(a,h)anthracene                              | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluoranthene  | J         | 43     | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluorene  | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 390    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Phenanthrene  | J         | 110    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |
| Pyrene  | J         | 110    | 200 | 390 | ug/kg | 1.0 |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WT    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 3

Sample ID : CH08098 SBS

| Parameter                      | Qualifier | Result | DL   | RL   | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|--------------------------------|-----------|--------|------|------|-------|-----|---------|----------|------|-------|---|---|
| <b>Metals Analysis</b>         |           |        |      |      |       |     |         |          |      |       |   |   |
| Silver                         | U         | 0.46   | 0.46 | 7.8  | mg/kg | 1.0 | JSS     | 08/22/95 | 1230 | 71339 | 5 | 2 |
| Arsenic                        | U         | 2.5    | 2.5  | 17.5 | mg/kg | 1.0 |         |          |      |       |   |   |
| Barium                         |           | 13.5   | 0.20 | 2    | mg/kg | 1.0 |         |          |      |       |   |   |
| Cadmium                        | U         | 0.19   | 0.20 | 2    | mg/kg | 1.0 |         |          |      |       |   |   |
| Chromium                       |           | 8.6    | 0.30 | 2    | mg/kg | 1.0 |         |          |      |       |   |   |
| Lead                           |           | 5.9    | 2.2  | 5.8  | mg/kg | 1.0 |         |          |      |       |   |   |
| Selenium                       | U         | 4.9    | 5.0  | 17.5 | mg/kg | 1.0 |         |          |      |       |   |   |
| Mercury                        |           | 0.09   | 0.02 | 0.03 | mg/kg | 1.0 | BBJ     | 08/24/95 | 1824 | 71296 | 6 | 2 |
| <b>General Chemistry</b>       |           |        |      |      |       |     |         |          |      |       |   |   |
| Total Rec. Petro. Hydrocarbons |           | 342    | 12   | 12   | mg/kg | 1.0 | CAM     | 08/22/95 | 1130 | 71459 | 7 | 1 |

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

ICP

Mercury

CPU 08/24/95 1430 71625 4  
DVW 08/19/95 1010 71339 8  
BBJ 08/22/95 1600 71296 6

| Surrogate Recovery    | Test          | Percent% | Acceptable Limits |
|-----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl      | M610          | 98.8     | (36.0 - 114.)     |
| Nitrobenzene-d5       | M610          | 75.4     | (23.0 - 120.)     |
| p-Terphenyl-d14       | M610          | 131.     | (51.8 - 135.)     |
| 1,2-Dichloroethane-d4 | TCTFE-MSV     | 105.     | (70.0 - 121.)     |
| 1,2-Dichloroethane-d4 | TCTFE-MSV     | 105.     | (70.0 - 121.)     |
| Bromofluorobenzene    | TCTFE-MSV     | 94.4     | (74.7 - 118.)     |
| Bromofluorobenzene    | TCTFE-MSV     | 94.4     | (74.7 - 118.)     |
| Toluene-d8            | TCTFE-MSV     | 95.6     | (81.0 - 117.)     |
| Toluene-d8            | TCTFE-MSV     | 95.6     | (81.0 - 117.)     |
| Bromofluorobenzene    | BTEX/NAP-8260 | 110.     | (80.0 - 120.)     |
| Dibromofluoromethane  | BTEX/NAP-8260 | 116.     | (80.0 - 120.)     |
| Toluene-d8            | BTEX/NAP-8260 | 106.     | (80.0 - 120.)     |



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 3 of 3

Sample ID : CH08098 SBS

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8240 extended  |
| M 2        | EPA 8260           |
| M 3        | EPA 3550           |
| M 4        | EPA 8270           |
| M 5        | EPA 6010A          |
| M 6        | EPA 7471           |
| M 7        | EPA 9071           |
| M 8        | EPA 3050           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 2           | 9508388-03.02     | CH0809801    |
|               | 9508388-03.01     | CH0809802    |

### Notes:


The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist







# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | DEL          | EPI          |
| FL    | EE7154/87294 | EE7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02894        |              |
| VA    | 00151        |              |
| WT    | 0003779      |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 2

Sample ID : 9508388-03 RAO CH08098 SBS  
Lab ID : 9508388-12  
Matrix : Soil  
Date Collected : 08/14/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatiles Organics</b>             |           |        |    |    |       |     |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |     |         |          |      |       |   |   |
| Benzene                               | U         | 12     | 1  | 12 | ug/kg | 1.0 | TLD     | 08/29/95 | 1856 | 71823 | 1 | 1 |
| Ethylbenzene                          | U         | 12     | 1  | 12 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                           | U         | 12     | 1  | 12 | ug/kg | 1.0 |         |          |      |       |   |   |
| Toluene                               | U         | 12     | 1  | 12 | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                | U         | 12     | 1  | 12 | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 12     | 1  | 12 | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 17     | 1  | 1  | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71919 | 2 | N |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 106.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 102.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 99.5     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 3550           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 1           | 9508388-12.01     | CH0809801    |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EMI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 2

Sample ID : 9508388-03 RAO CH08098 SBS

C = Container      Lab. Container ID      Reference ID

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed

in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



TANK 2

FREON  
GROUP #2



# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | QEL          | EP1          |
|-------|--------------|--------------|
| FL    | EF7156/87294 | EF7472/87431 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02934        |              |
| VA    | 00131        |              |
| WI    | 00001779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Kaller  
Project Description: Charleston/CH

Table #2, Group II, EOC 206  
- Gas Phase of ...

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 3

Sample ID : CH08099 SBS  
Lab ID : 9508388-04  
Matrix : Soil  
Date Collected : 08/14/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |     |     |       |     |         |          |      |       |   |   |
| Trichlorotrifluoroethane                            | J         | 1      | 11  | 11  | ug/kg | 1.0 | SME     | 08/24/95 | 1739 | 71666 | 1 | 1 |
| <b>BTEX and Naphthalene - 6 items</b>               |           |        |     |     |       |     |         |          |      |       |   |   |
| Benzene   | U         | 11     | 1   | 11  | ug/kg | 1.0 | TLD     | 08/28/95 | 1133 | 71823 | 2 | N |
| Toluene   | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| o-Xylene  | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| m-Xylene  | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| p-Xylene  | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Organic Prep  |           |        |     |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            |           | 13     | 1   | 1   | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71274 | 3 | 2 |
| <b>Extractable Organics</b>                         |           |        |     |     |       |     |         |          |      |       |   |   |
| <b>Polynuclear Aromatic Hydrocarbons - 16 items</b> |           |        |     |     |       |     |         |          |      |       |   |   |
| Acenaphthene  | U         | 380    | 190 | 380 | ug/kg | 1.0 | JCB     | 08/28/95 | 1845 | 71625 | 4 | 2 |
| Acenaphthylene                                      | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Anthracene  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(ghi)perylene                                  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Chrysene  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Dibenz(a,h)anthracene                               | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluoranthene  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluorene  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Phenanthrene  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |
| Pyrene  | U         | 380    | 190 | 380 | ug/kg | 1.0 |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 3

Sample ID : CH08099 SBS

| Parameter                      | Qualifier | Result | DL   | RL   | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|--------------------------------|-----------|--------|------|------|-------|-----|---------|----------|------|-------|---|---|
| <b>Metals Analysis</b>         |           |        |      |      |       |     |         |          |      |       |   |   |
| Silver                         | U         | 0.44   | 0.44 | 2    | mg/kg | 1.0 | JSS     | 08/22/95 | 1232 | 71339 | 5 | 2 |
| Arsenic                        | U         | 2.4    | 2.4  | 16.8 | mg/kg | 1.0 |         |          |      |       |   |   |
| Barium                         |           | 8.6    | 0.20 | 2    | mg/kg | 1.0 |         |          |      |       |   |   |
| Cadmium                        | U         | 0.19   | 0.19 | 2    | mg/kg | 1.0 |         |          |      |       |   |   |
| Chromium                       |           | 4.4    | 0.30 | 2    | mg/kg | 1.0 |         |          |      |       |   |   |
| Lead                           | B         | 2.1    | 2.1  | 5.6  | mg/kg | 1.0 |         |          |      |       |   |   |
| Selenium                       | U         | 4.7    | 4.7  | 16.8 | mg/kg | 1.0 |         |          |      |       |   |   |
| Mercury                        | U         | 0.02   | 0.02 | 0.03 | mg/kg | 1.0 | BBJ     | 08/24/95 | 1827 | 71296 | 6 | 2 |
| <b>General Chemistry</b>       |           |        |      |      |       |     |         |          |      |       |   |   |
| Total Rec. Petro. Hydrocarbons |           | 341    | 11   | 11   | mg/kg | 1.0 | CAM     | 08/22/95 | 1130 | 71459 | 7 | 2 |

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

CPU 08/24/95 1430 71625 4

ICP

DVW 08/19/95 1010 71339 8

Mercury

BBJ 08/22/95 1600 71296 6

| Surrogate Recovery    | Test          | Percent% | Acceptable Limits |
|-----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl      | M610          | 88.6     | (36.0 - 114.)     |
| Nitrobenzene-d5       | M610          | 74.8     | (23.0 - 120.)     |
| p-Terphenyl-d14       | M610          | 84.4     | (51.8 - 135.)     |
| 1,2-Dichloroethane-d4 | TCTFE-MSV     | 99.2     | (70.0 - 121.)     |
| Bromofluorobenzene    | TCTFE-MSV     | 92.0     | (74.7 - 118.)     |
| Toluene-d8            | TCTFE-MSV     | 92.8     | (81.0 - 117.)     |
| Bromofluorobenzene    | BTEX/NAP-8260 | 94.6     | (80.0 - 120.)     |
| Dibromofluoromethane  | BTEX/NAP-8260 | 111.     | (80.0 - 120.)     |
| Toluene-d8            | BTEX/NAP-8260 | 98.2     | (80.0 - 120.)     |

M = Method

Method-Description

M1 EPA 8240 extended

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EX7156/87294 | EX7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 3 of 3

Sample ID : CH08099 SBS

| M = Method | Method-Description |
|------------|--------------------|
| M 2        | EPA 8260           |
| M 3        | EPA 3550           |
| M 4        | EPA 8270           |
| M 5        | EPA 6010A          |
| M 6        | EPA 7471           |
| M 7        | EPA 9071           |
| M 8        | EPA 3050           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
|               | 9508388-04.02     | CH0809901    |
|               | 9508388-04.01     | CH0809902    |

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed

in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (803) 769-7391.

Analytical Report Specialist





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 10018778     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 2

Sample ID : 9508388-04 RAO CH08099 SBS  
Lab ID : 9508388-13  
Matrix : Soil  
Date Collected : 08/14/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |     |         |          |      |       |   |   |
| <b>BTEX and Naphthalene - 6 items</b> |           |        |    |    |       |     |         |          |      |       |   |   |
| Benzene                               | U         | 11     | 1  | 11 | ug/kg | 1.0 | TLD     | 08/29/95 | 1955 | 71823 | 1 | 1 |
| Ethylbenzene                          | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                           | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Toluene                               | J         | 1      | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 13     | 1  | 1  | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71919 | 2 | N |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 102      | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 110      | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 98.4     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 3550           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 1           | 9508388-13.01     | CH0809901    |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 2

Sample ID : 9508388-04 RAO CH08099 SBS

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
|---------------|-------------------|--------------|

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

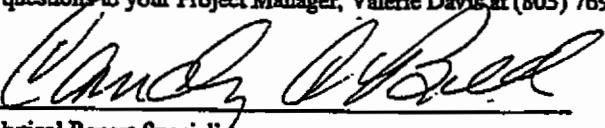
Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed

in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist







# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ET7154/87294 | ET7472/87451 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02834        |              |
| VA    | 00151        |              |
| WV    | 9801373      |              |

## CERTIFICATE OF ANALYSIS

TANK #2, GROUP I, BLDG 216  
- WEST END OF TANK

Client: Bechnel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Mr. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 3

Sample ID : CH08100 SBS  
Lab ID : 9508388-05  
Matrix : Soil  
Date Collected : 08/14/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |     |     |       |     |         |          |      |       |   |   |
| Trichlorotrifluoroethane                            | J         | 1      | 11  | 11  | ug/kg | 1.0 | SME     | 08/24/95 | 2016 | 71666 | 1 | 1 |
| <b>BTEX and Naphthalene - 6 items</b>               |           |        |     |     |       |     |         |          |      |       |   |   |
| Benzene   | U         | 11     | 1   | 11  | ug/kg | 1.0 | TLD     | 08/29/95 | 0000 | 71823 | 2 | 1 |
| Ethylbenzene  | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Toluene   | J         | 5      | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                              | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene  | U         | 11     | 1   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                                 |           |        |     |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            |           | 9.0    | 1   | 1   | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71274 | 3 | 2 |
| <b>Extractable Organics</b>                         |           |        |     |     |       |     |         |          |      |       |   |   |
| <b>Polynuclear Aromatic Hydrocarbons - 16 items</b> |           |        |     |     |       |     |         |          |      |       |   |   |
| Acenaphthene  | U         | 370    | 190 | 370 | ug/kg | 1.0 | ICB     | 08/29/95 | 1813 | 71728 | 4 | 2 |
| Acenaphthylene                                      | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Anthracene  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(ghi)perylene                                  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Chrysene  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Dibenzo(a,h)anthracene                              | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluoranthene  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluorene  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Phenanthrene  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Pyrene  | U         | 370    | 190 | 370 | ug/kg | 1.0 |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 3

| Sample ID                      |           | : CH08100 SBS |      |      |       |     |         |          |      |       |     |
|--------------------------------|-----------|---------------|------|------|-------|-----|---------|----------|------|-------|-----|
| Parameter                      | Qualifier | Result        | DL   | RL   | Units | DF  | Analyst | Date     | Time | Batch | M C |
| <b>Metals Analysis</b>         |           |               |      |      |       |     |         |          |      |       |     |
| Silver                         | U         | 0.42          | 0.42 | 2    | mg/kg | 1.0 | JSS     | 08/22/95 | 1237 | 71339 | 5 2 |
| Arsenic                        | U         | 2.3           | 2.3  | 16.2 | mg/kg | 1.0 |         |          |      |       |     |
| Barium                         |           | 22.4          | 0.20 | 2    | mg/kg | 1.0 |         |          |      |       |     |
| Cadmium                        | U         | 0.18          | 0.18 | 2    | mg/kg | 1.0 |         |          |      |       |     |
| Chromium                       |           | 13.2          | 0.30 | 2    | mg/kg | 1.0 |         |          |      |       |     |
| Lead                           | B         | 3.8           | 2.0  | 5.4  | mg/kg | 1.0 |         |          |      |       |     |
| Selenium                       | U         | 4.5           | 4.5  | 16.2 | mg/kg | 1.0 |         |          |      |       |     |
| Mercury                        |           | 0.04          | 0.02 | 0.03 | mg/kg | 1.0 | BBJ     | 08/24/95 | 1829 | 71296 | 6 2 |
| <b>General Chemistry</b>       |           |               |      |      |       |     |         |          |      |       |     |
| Total Rec. Petro. Hydrocarbons |           | 359           | 11   | 11   | mg/kg | 1.0 | CAM     | 08/22/95 | 1130 | 71459 | 7 2 |

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

MBB 08/25/95 1800 71728 4

ICP

DVW 08/19/95 1010 71339 8

Mercury

BBJ 08/22/95 1600 71296 6

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Fluorobiphenyl       | M610          | 88.6     | (36.0 - 114.)     |
| Nitrobenzene-d5      | M610          | 71.0     | (23.0 - 120.)     |
| Terphenyl-d14        | M610          | 82.6     | (31.8 - 135.)     |
| 2-Dichloroethane-d4  | TCTFE-MSV     | 103.     | (70.0 - 121.)     |
| Bromofluorobenzene   | TCTFE-MSV     | 92.4     | (74.7 - 118.)     |
| Toluene-d8           | TCTFE-MSV     | 98.8     | (81.0 - 117.)     |
| Bromofluorobenzene   | BTEX/NAP-8260 | 104.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 111.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 109.     | (80.0 - 120.)     |

M = Method

Method-Description

M1

EPA 8240 extended

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 3 of 3

Sample ID : CH08100 SBS

| M = Method | Method-Description |
|------------|--------------------|
| M 2        | EPA 8260           |
| M 3        | EPA 3550           |
| M 4        | EPA 8270           |
| M 5        | EPA 6010A          |
| M 6        | EPA 7471           |
| M 7        | EPA 9071           |
| M 8        | EPA 3050           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 1           | 9508388-05.01     | CH0810002    |
| C 2           | 9508388-05.02     | CH0810001    |

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | QEL         | EPI           |
|-------|-------------|---------------|
| FL    | EST15687294 | EST7472/87438 |
| NC    | 233         |               |
| SC    | 10120       | 10582         |
| TN    | 00894       |               |
| VA    | 00151       |               |
| WI    | 8888779     |               |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 2

Sample ID : 9508388-05 RAO CH08100 SBS  
Lab ID : 9508388-14  
Matrix : Soil  
Date Collected : 08/14/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter                               | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                |           |        |    |    |       |     |         |          |      |       |   |   |
| <b>BTEX and Naphthalene - 6 items -</b> |           |        |    |    |       |     |         |          |      |       |   |   |
| Benzene                                 | U         | 11     | 1  | 11 | ug/kg | 1.0 | TLD     | 08/29/95 | 2023 | 71823 | 1 | 1 |
| Ethylbenzene                            | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                             | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| ms                                      | J         | 3      | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                  | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                            | U         | 11     | 1  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Organic Prep                            |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                |           | 9.0    | 1  | 1  | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71919 | 2 | N |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 108.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 102.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 105.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8260           |
| M2         | EPA 3350           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C1            | 9508388-14.01     | CH0810002    |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller

Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 2

Sample ID : 9508388-05 RAO CH08100 SBS

C = Container      Lab. Container ID      Reference ID

### Notes:

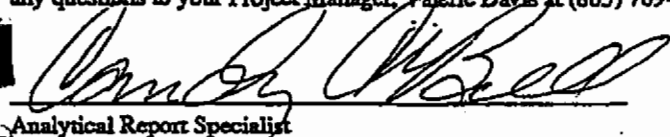
The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist

TANK 4

OIL  
GROUP #1



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EX7156/87294 | EX7472/87451 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 9598X779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

TRAC = 4, Group = 1, 300 & 200  
- center of mass

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 3

Sample ID : CH08107 SBS  
Lab ID : 9508409-05  
Matrix : Soil  
Date Collected : 08/17/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter                                    | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|--|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| Volatile Organics                            |           |        |     |     |       |     |         |          |      |       |   |   |
| BTEX and Naphthalene - 6 items               |           |        |     |     |       |     |         |          |      |       |   |   |
| Benzene                                      | U         | 11     | 2   | 11  | ug/kg | 1.0 | TLD     | 08/31/95 | 0128 | 71967 | 1 | 1 |
| Ethylbenzene                                 | U         | 11     | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                                  | J         | 1      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Toluene                                      | J         | 9      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                       | J         | 1      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                                 | J         | 1      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Organic Prep                                 |           |        |     |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                     |           | 7.0    | 1   | 1   | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 71934 | 2 | 2 |
| Extractable Organics                         |           |        |     |     |       |     |         |          |      |       |   |   |
| Polynuclear Aromatic Hydrocarbons - 18 items |           |        |     |     |       |     |         |          |      |       |   |   |
| 1-Methylnaphthalene                          | U         | 350    | 350 | 350 | ug/kg | 1.0 | WAM     | 08/29/95 | 1517 | 71810 | 3 | 2 |
| 2-Methylnaphthalene                          | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthene                                 | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthylene                               | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Anthracene                                   | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)anthracene                           | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)pyrene                               | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                         | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(ghi)perylene                           | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                         | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Chrysene                                     | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a,h)anthracene                         | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluoranthene                                 | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluorene                                     | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                      | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                                  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Phenanthrene                                 | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EX7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 3

Sample ID : CH08107 SBS

| Parameter | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date | Time | Batch | M | C |
|-----------|-----------|--------|-----|-----|-------|-----|---------|------|------|-------|---|---|
| Pyrene    | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |      |      |       |   |   |

The following prep procedures were performed:  
GC/MS Base/Neutral Compounds

DDT 08/28/95 2300 71810 3

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl     | M610-BECH     | 78.2     | (36.0 - 114.)     |
| Nitrobenzene-d5      | M610-BECH     | 94.0     | (23.0 - 120.)     |
| phenyl-d14           | M610-BECH     | 108.     | (51.8 - 135.)     |
| Bromofluorobenzene   | BTEX/NAP-8260 | 119.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 102.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 105.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8260           |
| M2         | EPA 3550           |
| M3         | EPA 8270           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C1            | 9508409-05.01     | CH0810701    |
| C2            | 9508409-05.02     | CH0810702    |





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | EX7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 3 of 3

Sample ID : CH08107 SBS

C = Container      Lab. Container ID      Reference ID

### Notes:

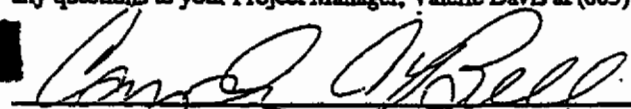
The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EST156/87294 | EST472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02894        |              |
| VA    | 00151        |              |
| WI    | 9998779      |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 2

Sample ID : 9508409-05 RAO CH08107  
Lab ID : 9508409-10  
Matrix : Soil  
Date Collected : 08/17/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |     |         |          |      |       |   |   |
| <b>BTEX and Naphthalene - 6 items</b> |           |        |    |    |       |     |         |          |      |       |   |   |
| Benzene                               | U         | 11     | 2  | 11 | ug/kg | 1.0 | TLD     | 09/05/95 | 1618 | 71967 | 1 | N |
| Ethylbenzene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| m-Xylenes                             | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| p-Xylenes                             | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 7.0    | 1  | 1  | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 72166 | 2 | N |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 114.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 102.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 103.     | (80.0 - 120.)     |

M = Method

Method-Description

|     |          |
|-----|----------|
| M 1 | EPA 8260 |
| M 2 | EPA 3350 |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 2

Sample ID : 9508409-05 RA0 CH08107

M = Method

Method-Description

### Notes:

The qualifiers in this report are defined as follows:  
I indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)  
U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist

TANK 5

OIL  
GROUP #1



# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | QEL          | EPI          |
|-------|--------------|--------------|
| FL    | EE7156/ET294 | EE7472/ET458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99881779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

TANK #5, GROUP # I, SLOG 256  
- SOUTH END OF TANK

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 3

Sample ID : CH08109 SBS  
Lab ID : 9508409-03  
Matrix : Soil  
Date Collected : 08/17/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |     |     |       |     |         |          |      |       |   |   |
| <b>BTEX and Naphthalene - 6 items</b>               |           |        |     |     |       |     |         |          |      |       |   |   |
| Benzene   | J         | 1      | 2   | 11  | ug/kg | 1.0 | TLD     | 08/31/95 | 0256 | 71967 | 1 | 1 |
| Ethylbenzene  | J         | 1      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 11     | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Toluene   | E         | 700    | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                              | J         | 2      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene  | U         | 11     | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                                 |           |        |     |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            |           | 8.0    | 1   | 1   | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 71934 | 2 | 2 |
| <b>Extractable Organics</b>                         |           |        |     |     |       |     |         |          |      |       |   |   |
| <b>Polynuclear Aromatic Hydrocarbons - 18 items</b> |           |        |     |     |       |     |         |          |      |       |   |   |
| 1-Methylnaphthalene                                 | U         | 350    | 350 | 350 | ug/kg | 1.0 | WAM     | 08/29/95 | 1625 | 71810 | 3 | 2 |
| 2-Methylnaphthalene                                 | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthene  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthylene                                      | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Anthracene  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(g,h,i)perylene                                | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Chrysene  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Dibenz(a,h)anthracene                               | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluoranthene  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluorene  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |
| Phenanthrene  | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |          |      |       |   |   |





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 3

Sample ID : CH08109 SBS

| Parameter | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date | Time | Batch | M | C |
|-----------|-----------|--------|-----|-----|-------|-----|---------|------|------|-------|---|---|
| Pyrene    | U         | 350    | 180 | 350 | ug/kg | 1.0 |         |      |      |       |   |   |

The following prep procedures were performed:  
GC/MS Base/Neural Compounds

DDT 08/28/95 2300 71810 3

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl     | M610-BECH     | 86.8     | (36.0 - 114.)     |
| Nitrobenzene-d5      | M610-BECH     | 116.     | (23.0 - 120.)     |
| Chlorophenyl-d14     | M610-BECH     | 103.     | (51.8 - 135.)     |
| Monofluorobenzene    | BTEX/NAP-8260 | 134.*    | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 99.8     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 94.4     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 3550           |
| M 3        | EPA 8270           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 1           | 9508409-03.01     | CH0810901    |
| C 2           | 9508409-03.02     | CH0810902    |





# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | GEL          | EPF          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E37472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988773     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 3 of 3

Sample ID : CH08109 SBS

C = Container      Lab. Container ID      Reference ID

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EX7156/87294 | EX7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02834        |              |
| VA    | 00151        |              |
| WI    | 9998273      |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 2

Sample ID : 9508409-03 RAO CH08109  
Lab ID : 9508409-09  
Matrix : Soil  
Date Collected : 08/17/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |     |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |     |         |          |      |       |   |   |
| Benzene                               | U         | 11     | 2  | 11 | ug/kg | 1.0 | TLD     | 09/05/95 | 1549 | 71967 | 1 | N |
| Ethylbenzene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                           | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Styrene                               | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 8.0    | 1  | 1  | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 72166 | 2 | N |

| Surrogate Recovery   | Test         | Percent% | Acceptable Limits |
|----------------------|--------------|----------|-------------------|
| Bromofluorobenzene   | BTEXNAP-8260 | 113.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEXNAP-8260 | 97.3     | (80.0 - 120.)     |
| Toluene-d8           | BTEXNAP-8260 | 104.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8260           |
| M2         | EPA 3550           |





# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99983779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECHD0594

Report Date: October 05, 1995

Page 2 of 2

Sample ID : 9508409-03 RAO CH08109

M = Method

Method-Description

### Notes:

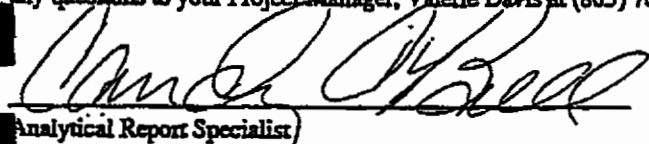
The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

Laboratory Certifications

| STATE | REL          | EPI          |
|-------|--------------|--------------|
| FL    | 857156/87294 | 857472/87454 |
| NC    | 223          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WV    | 9996779      |              |

## CERTIFICATE OF ANALYSIS

TAUX = S, Group = I, BODG 226  
- CENTER OF TAUX

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 3

Sample ID : CH08108 SBS  
Lab ID : 9508409-02  
Matrix : Soil  
Date Collected : 08/17/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatiles Organics</b>                           |           |        |     |     |       |     |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i>               |           |        |     |     |       |     |         |          |      |       |   |   |
| Benzene   | U         | 11     | 2   | 11  | ug/kg | 1.0 | TLD     | 08/30/95 | 2332 | 71967 | 1 | 1 |
| Ethylbenzene  | J         | 1      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| toluene   | J         | 1      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Xylenes   | E         | 590    | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                              | J         | 2      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene  | J         | 2      | 2   | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                                 |           |        |     |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            |           | 9.0    | 1   | 1   | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 71934 | 2 | 2 |
| <b>Extractable Organics</b>                         |           |        |     |     |       |     |         |          |      |       |   |   |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> |           |        |     |     |       |     |         |          |      |       |   |   |
| 1-Methylnaphthalene                                 | U         | 360    | 360 | 360 | ug/kg | 1.0 | WAM     | 08/29/95 | 1551 | 71810 | 3 | 2 |
| 2-Methylnaphthalene                                 | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthene  | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthylene                                      | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Anthracene  | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(g,h,i)perylene                                | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Chrysene  | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Dibenz(a,h)anthracene                               | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluoranthene  | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluorene  | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |
| Phenanthrene  | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller

Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 3

Sample ID : CH08108 SBS

| Parameter | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date | Time | Batch | M | C |
|-----------|-----------|--------|-----|-----|-------|-----|---------|------|------|-------|---|---|
| Pyrene    | U         | 360    | 190 | 360 | ug/kg | 1.0 |         |      |      |       |   |   |

The following prep procedures were performed:  
GC/MS Base/Neutral Compounds

DDT 08/28/95 2300 71810 3

| Surrogate Recovery   | Test          | Percent % | Acceptable Limits |
|----------------------|---------------|-----------|-------------------|
| 2-Fluorobiphenyl     | M610-BECH     | 85.0      | (36.0 - 114.)     |
| Nitrobenzene-d5      | M610-BECH     | 109.      | (23.0 - 120.)     |
| p-Terphenyl-d14      | M610-BECH     | 101.      | (51.8 - 135.)     |
| Bromofluorobenzene   | BTEX/NAP-8260 | 126.*     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 103.      | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 109.      | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8260           |
| M2         | EPA 3550           |
| M3         | EPA 8270           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C1            | 9508409-02.01     | CH0810801    |
| C2            | 9508409-02.02     | CH0810802    |



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 9998779      |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 3 of 3

Sample ID : CH08108 SBS

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
|---------------|-------------------|--------------|

### Notes:

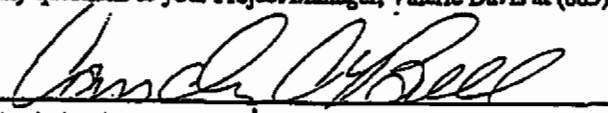
The qualifiers in this report are defined as follows:

I indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EP1          |
| FL    | EE7156/67294 | EE7472/67458 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 2

Sample ID : 9508409-02 RAO CH08108  
Lab ID : 9508409-08  
Matrix : Soil  
Date Collected : 08/17/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |     |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |     |         |          |      |       |   |   |
| Benzene                               | U         | 11     | 2  | 11 | ug/kg | 1.0 | TLD     | 09/05/95 | 1520 | 71967 | 1 | N |
| Ethylbenzene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                           | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Toluene                               | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 9.0    | 1  | 1  | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 72166 | 2 | N |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 117.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 97.0     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 104.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8260           |
| M2         | EPA 3550           |





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EX7156/87294 | EX7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 2

Sample ID : 9508409-02 RAO CH08108

M = Method

Method-Description

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist

TANK 6

OIL  
GROUP #1



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EE7156/67234 | EE7472/81458 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02834        |              |
| VA    | 00151        |              |
| WI    | 9998373      |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 3

Sample ID : CH08106 SBS  
Lab ID : 9508409-04  
Matrix : Soil  
Date Collected : 08/16/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL   | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|------|-----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |      |     |       |     |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i>               |           |        |      |     |       |     |         |          |      |       |   |   |
| Benzene   | U         | 11     | 2    | 11  | ug/kg | 1.0 | TLD     | 08/30/95 | 1946 | 71967 | 1 | 1 |
| Ethylbenzene  | J         | 2      | 2    | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | U         | 11     | 2    | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| o-Xylene  | E         | 1500   | 2    | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| m- and para-Xylenes                                 | J         | 3      | 2    | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene  | J         | 1      | 2    | 11  | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                                 |           |        |      |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            | U         | 1.0    | 0.00 | 1   | wt%   | 1.0 | SRP     | 08/31/95 | 1530 | 71934 | 2 | 2 |
| <b>Extractable Organics</b>                         |           |        |      |     |       |     |         |          |      |       |   |   |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> |           |        |      |     |       |     |         |          |      |       |   |   |
| 1-Methylnaphthalene                                 | UX        | 370    | 370  | 370 | ug/kg | 1.0 | WAM     | 08/29/95 | 1658 | 71810 | 3 | 2 |
| 2-Methylnaphthalene                                 | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthene  | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Acenaphthylene                                      | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Anthracene  | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | UX        | 220    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(ghi)perylene                                  | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Chrysene  | JX        | 200    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Dibenzo(a,h)anthracene                              | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluoranthene  | JX        | 320    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Fluorene  | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene   | UX        | 370    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |
| Phenanthrene  | JX        | 340    | 190  | 370 | ug/kg | 1.0 |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988279     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 3

Sample ID : CH08106 SBS

| Parameter | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date | Time | Batch | M | C |
|-----------|-----------|--------|-----|-----|-------|-----|---------|------|------|-------|---|---|
| Pyrene    | X         | 580    | 190 | 370 | ug/kg | 1.0 |         |      |      |       |   |   |

The following prep procedures were performed:  
GC/MS Base/Neutral Compounds

DDT 08/28/95 2300 71810 3

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl     | M610-BECH     | 88.2     | (36.0 - 114.)     |
| Nitrobenzene-d5      | M610-BECH     | 113.     | (23.0 - 120.)     |
| p-Terphenyl-d14      | M610-BECH     | 164.*    | (51.8 - 135.)     |
| Bromofluorobenzene   | BTEX/NAP-8260 | 143.*    | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 101.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 106.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8260           |
| M2         | EPA 3550           |
| M3         | EPA 8270           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C1            | 9508409-04.01     | CH0810604    |
| C2            | 9508409-04.02     | CH0810601    |



# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99983779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechuel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 3 of 3

Sample ID : CH08106 SBS

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
|---------------|-------------------|--------------|

### Notes:

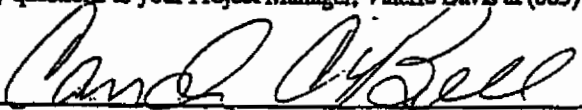
The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist





# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EE7156/67294 | EE7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 2

Sample ID : 9508409-04 RAD CH08106 SRS  
Lab ID : 9508409-07  
Matrix : Soil  
Date Collected : 08/16/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |     |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |     |         |          |      |       |   |   |
| Benzene                               | U         | 11     | 2  | 11 | ug/kg | 1.0 | TLD     | 09/05/95 | 1647 | 71967 | 1 | 1 |
| Ethylbenzene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Naphthalene                           | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| Toluene                               | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| meta- and para-Xylenes                | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 11     | 2  | 11 | ug/kg | 1.0 |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 12     | 1  | 1  | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 72166 | 2 | N |

| Surrogate Recovery   | Test         | Percent% | Acceptable Limits |
|----------------------|--------------|----------|-------------------|
| Bromofluorobenzene   | BTEXNAP-8260 | 120.     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEXNAP-8260 | 99.0     | (80.0 - 120.)     |
| Toluene-d8           | BTEXNAP-8260 | 102.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8260           |
| M2         | EPA 3550           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C1            | 9508409-07.01     | CH0810604    |





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 2

Sample ID : 9508409-04 RAO CH08106 SBS

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
|---------------|-------------------|--------------|

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EE7156/87294 | EE7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 9998879      |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 1 of 2

Sample ID : 9508409-04 DL1 CH08106 SBS  
Lab ID : 9508409-06  
Matrix : Soil  
Date Collected : 08/16/95  
Date Received : 08/18/95  
Priority : Routine  
Collector : Client

| Parameter                            | Qualifier | Result | DL   | RL   | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|--------------------------------------|-----------|--------|------|------|-------|-----|---------|----------|------|-------|---|---|
| Organic Prep                         |           |        |      |      |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C             |           | 12     | 1    | 1    | wt%   | 1.0 | SRP     | 08/31/95 | 1550 | 71934 | 1 | N |
| Extractable Organics                 |           |        |      |      |       |     |         |          |      |       |   |   |
| Polyaromatic Hydrocarbons - 18 items |           |        |      |      |       |     |         |          |      |       |   |   |
| 1-Methylnaphthalene                  | U         | 3700   | 3700 | 3700 | ug/kg | 10  | WAM     | 08/31/95 | 1432 | 71810 | 2 |   |
| 2-Methylnaphthalene                  | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Acenaphthene                         | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Acenaphthylene                       | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Anthracene                           | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Benzo(a)anthracene                   | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Benzo(a)pyrene                       | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Benzo(b)fluoranthene                 | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Benzo(g,h,i)perylene                 | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Benzo(k)fluoranthene                 | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Chrysene                             | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Dibenz(a,h)anthracene                | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Fluoranthene                         | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Fluorene                             | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene              | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Naphthalene                          | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Phenanthrene                         | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |
| Pyrene                               | U         | 3700   | 1900 | 3700 | ug/kg | 10  |         |          |      |       |   |   |

The following prep procedures were performed:  
GC/MS Base/Neutral Compounds

DDT 08/28/95 2300 71810 2

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 05, 1995

Page 2 of 2

Sample ID : 9508409-04 DL1 CH08106 SBS

| Surrogate Recovery | Test      | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl   | M610-BECH | 140.*    | (36.0 - 114.)     |
| Nitrobenzene-d5    | M610-BECH | 138.*    | (23.0 - 120.)     |
| p-Terphenyl-d14    | M610-BECH | 182.*    | (51.8 - 135.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 3550           |
| M2         | EPA 8270           |

| Container | Lab. Container ID | Reference ID |
|-----------|-------------------|--------------|
| C1        | 9508409-06.01     | CH0810601    |

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed

in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist

**TANK 7**

**RECLAIMED FREON  
GROUP #3**



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | ER7156/87294 | ER7472/87438 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02834        |              |
| VA    | 00151        |              |
| WI    | 00083720     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

TANK #7, GROUP II, SLO 226  
- NORTH END OF TANK

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 2

Sample ID : CH08102 SBS  
Lab ID : 9508388-07  
Matrix : Soil  
Date Collected : 08/15/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter                | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|--------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b> |           |        |    |    |       |     |         |          |      |       |   |   |
| Trichlorotrifluoroethane | E         | 430    | 11 | 11 | ug/kg | 1.0 | SME     | 08/24/95 | 2118 | 71666 | 1 | 1 |
| <b>Organic Prep</b>      |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C |           | 14     | 1  | 1  | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71274 | 2 | 2 |

| Spigots Recovery      | Test      | Percent % | Acceptable Limits |
|-----------------------|-----------|-----------|-------------------|
| 1,2-Dichloroethane-d4 | TCIFE-MSV | 102       | (70.0 - 121.)     |
| Bromofluorobenzene    | TCIFE-MSV | 96.8      | (74.7 - 118.)     |
| Toluene-d8            | TCIFE-MSV | 93.2      | (81.0 - 117.)     |

### M = Method

### Method-Description

|    |                   |
|----|-------------------|
| M1 | EPA 8240 extended |
| M2 | EPA 3550          |

### C = Container

### Lab. Container ID

### Reference ID

|    |               |           |
|----|---------------|-----------|
| C1 | 9508388-07.01 | CH0810201 |
| C2 | 9508388-07.02 | CH0810202 |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller

Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 2

Sample ID : CH08102 SBS

C = Container

Lab. Container ID

Reference ID

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed

in accordance with General Engineering Laboratories

standard operating procedures. Please direct

any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | EX7156/87294 | EX7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 82934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 2

Sample ID : 9508388-07 DL1 CH08102 SBS  
Lab ID : 9508388-09  
Matrix : Soil  
Date Collected : 08/15/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter                | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|--------------------------|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| Volatile Organics        |           |        |     |     |       |     |         |          |      |       |   |   |
| Trichlorotrifluoroethane | D         | 140    | 120 | 120 | ug/kg | 10. | SME     | 08/25/95 | 1610 | 71666 | 1 | N |
| Organic Prep             |           |        |     |     |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C |           | 14     | 1   | 1   | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71848 | 2 | N |

| Surrogate Recovery    | Test      | Percent% | Acceptable Limits |
|-----------------------|-----------|----------|-------------------|
| 1,2-Dichloroethane-d4 | TCTFE-MSV | 99.6     | (70.0 - 121.)     |
| Bromofluorobenzene    | TCTFE-MSV | 93.2     | (74.7 - 118.)     |
| Toluene-d8            | TCTFE-MSV | 99.2     | (81.0 - 117.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8240 extended  |
| M2         | EPA 3550           |

### Notes:

The qualifiers in this report are defined as follows:

- J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)
- U indicates presence of analyte < DL (Detect Limit)

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EE7156/87294 | EE7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller

Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 2

Sample ID : 9508388-07 DL1 CH08102 SBS

M = Method

Method-Description

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EE7156/87294 | EE7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00451        |              |
| WT    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

TANK # 1, Group "II", BLDG 23C  
- SOUTH END OF TANK

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 1 of 2

Sample ID : CH08103 SBS  
Lab ID : 9508388-08  
Matrix : Soil  
Date Collected : 08/15/95  
Date Received : 08/15/95  
Priority : Routine  
Collector : Client

| Parameter                | Qualifier | Result | DL | RL | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|--------------------------|-----------|--------|----|----|-------|-----|---------|----------|------|-------|---|---|
| Volatile Organics        |           |        |    |    |       |     |         |          |      |       |   |   |
| Trichlorotrifluoroethane | J         | 2      | 11 | 11 | ug/kg | 1.0 | SME     | 08/24/95 | 2149 | 71666 | 1 | 1 |
| Organic Prep             |           |        |    |    |       |     |         |          |      |       |   |   |
| Evaporative Loss @ 105 C |           | 6.0    | 1  | 1  | wt%   | 1.0 | DDT     | 08/19/95 | 1000 | 71274 | 2 | 2 |

| Surrogate Recovery    | Test      | Percent% | Acceptable Limits |
|-----------------------|-----------|----------|-------------------|
| 1,2-Dichloroethane-d4 | TCTFE-MSV | 82.8     | (70.0 - 121.)     |
| Bromofluorobenzene    | TCTFE-MSV | 96.0     | (74.7 - 118.)     |
| Toluene-d8            | TCTFE-MSV | 92.0     | (81.0 - 117.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8240 extended  |
| M 2        | EPA 3550           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 1           | 9508388-08.02     | CH0810301    |
| C 2           | 9508388-08.01     | CH0810302    |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller

Project Description: Charleston/CH

cc: BECH00594

Report Date: October 06, 1995

Page 2 of 2

Sample ID : CH08103 SBS

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
|---------------|-------------------|--------------|

### Notes:

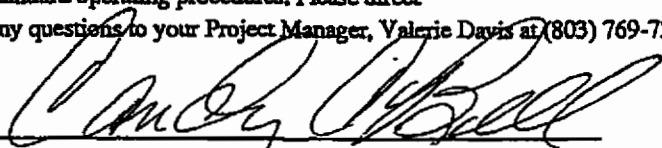
The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist

TANK 9

FUEL OIL  
GROUP #4

# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | EX7156/87294 | EX7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WT    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

SOIL SAMPLE  
BOTTOM OF HOLE #4  
IN TANK GROUP #4  
AT NSY BUDG 236 TANK 9

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 3

Sample ID : CH08093 SBS  
Lab ID : 9508265-01  
Matrix : SBS  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |     |     |       |    |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i>               |           |        |     |     |       |    |         |          |      |       |   |   |
| Benzene   | J         | 0.1    | 2   | 11  | ug/kg | 1  | TLD     | 08/24/95 | 1824 | 71677 | 1 | 1 |
| Ethylbenzene  | J         | 0.1    | 2   | 11  | ug/kg | 1  |         |          |      |       |   |   |
| Naphthalene   | JB        | 0.9    | 2   | 11  | ug/kg | 1  |         |          |      |       |   |   |
| Toluene   | J         | 3      | 2   | 11  | ug/kg | 1  |         |          |      |       |   |   |
| meta- and para-Xylenes                              | J         | 0.2    | 2   | 11  | ug/kg | 1  |         |          |      |       |   |   |
| ortho-Xylene  | J         | 0.1    | 2   | 11  | ug/kg | 1  |         |          |      |       |   |   |
| <b>Organic Prep</b>                                 |           |        |     |     |       |    |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            |           | 12     | 1   | 1   | wt%   | 1  | DDT     | 08/19/95 | 1000 | 71274 | 2 | 2 |
| <b>Extractable Organics</b>                         |           |        |     |     |       |    |         |          |      |       |   |   |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> |           |        |     |     |       |    |         |          |      |       |   |   |
| 1-Methylnaphthalene                                 | U         | 380    | 380 | 380 | ug/kg | 1  | ICB     | 08/25/95 | 2205 | 71625 | 3 | 2 |
| 2-Methylnaphthalene                                 | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Acenaphthene  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Acenaphthylene                                      | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Anthracene  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(ghi)perylene                                  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Chrysene  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Dibenzo(a,h)anthracene                              | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Fluoranthene  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Fluorene  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Naphthalene   | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |
| Phenanthrene  | U         | 380    | 190 | 380 | ug/kg | 1  |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 3

Sample ID : CH08093 SBS

| Parameter                   | Qualifier | Result | DL   | RL   | Units | DF | Analyst | Date     | Time | Batch | M | C |
|-----------------------------|-----------|--------|------|------|-------|----|---------|----------|------|-------|---|---|
| Pyrene                      | U         | 380    | 190  | 380  | ug/kg | 1  |         |          |      |       |   |   |
| Metals Analysis             |           |        |      |      |       |    |         |          |      |       |   |   |
| Silver                      | U         | 0.43   | 0.43 | 2    | mg/kg | 1  | JSS     | 08/22/95 | 1214 | 71339 | 4 | 3 |
| Arsenic                     | U         | 2.3    | 2.3  | 16.6 | mg/kg | 1  |         |          |      |       |   |   |
| Barium                      |           | 3.6    | 0.20 | 2    | mg/kg | 1  |         |          |      |       |   |   |
| Cadmium                     | U         | 0.18   | 0.18 | 2    | mg/kg | 1  |         |          |      |       |   |   |
| Chromium                    |           | 6.5    | 0.30 | 2    | mg/kg | 1  |         |          |      |       |   |   |
| Lead                        | B         | 2.5    | 2.1  | 5.5  | mg/kg | 1  |         |          |      |       |   |   |
| Selenium                    | U         | 4.7    | 4.7  | 16.6 | mg/kg | 1  |         |          |      |       |   |   |
| Mercury                     | U         | 0.02   | 0.02 | 0.03 | mg/kg | 1  | BBJ     | 08/24/95 | 1812 | 71296 | 5 | 3 |
| General Chemistry           |           |        |      |      |       |    |         |          |      |       |   |   |
| ul Rec. Petro. Hydrocarbons |           | 144    | 11.4 | 11.4 | mg/kg | 1  | CAM     | 08/18/95 | 1300 | 71283 | 6 | 4 |

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

CPU 08/24/95 1430 71625 3

ICP

DVW 08/19/95 1010 71339 7

Mercury

BBJ 08/22/95 1600 71296 5

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl     | M610-BECH     | 93.2     | (36.0 - 114.)     |
| Nitrobenzene-d5      | M610-BECH     | 75.2     | (23.0 - 120.)     |
| p-Terphenyl-d14      | M610-BECH     | 80.2     | (51.8 - 135.)     |
| Bromofluorobenzene   | BTEX/NAP-8260 | 77.2*    | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 104.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 95.4     | (80.0 - 120.)     |

M = Method

Method-Description

|     |          |
|-----|----------|
| M 1 | EPA 8260 |
| M 2 | EPA 3550 |
| M 3 | EPA 8270 |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | EX7156/87294 | EX7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Becfitel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 3 of 3

Sample ID : CH08093 SBS

| M = Method | Method-Description |
|------------|--------------------|
| M 4        | EPA 6010A          |
| M 5        | EPA 7471           |
| M 6        | EPA 9071           |
| M 7        | EPA 3050           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 1           | 9508265-01.03     | CH0809301    |
| C 2           | 9508265-01.01     | CH0809304    |
| C 3           | 9508265-01.04     | CH0809302    |
| C 4           | 9508265-01.02     | CH0809303    |

### Notes:


The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL         | EPI         |
|-------|-------------|-------------|
| FL    | EST15687294 | EST47287458 |
| NC    | 233         |             |
| SC    | 10120       | 10582       |
| TN    | 02934       |             |
| VA    | 00151       |             |
| WI    | 99988773    |             |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 2

Sample ID : 9508265-01 RAO CH08093 SBS  
Lab ID : 9508265-06  
Matrix : Soil  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |    |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |    |         |          |      |       |   |   |
| Benzene                               | U         | 11     | 2  | 11 | ug/kg | 1  | TLD     | 08/25/95 | 2213 | 71747 | 1 | N |
| Ethylbenzene                          | U         | 11     | 2  | 11 | ug/kg | 1  |         |          |      |       |   |   |
| Naphthalene                           | J         | 0.7    | 2  | 11 | ug/kg | 1  |         |          |      |       |   |   |
| luene                                 | J         | 1      | 2  | 11 | ug/kg | 1  |         |          |      |       |   |   |
| meta- and para-Xylenes                | J         | 0.1    | 2  | 11 | ug/kg | 1  |         |          |      |       |   |   |
| ortho-Xylene                          | J         | 0.1    | 2  | 11 | ug/kg | 1  |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |    |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 12     | 1  | 1  | wt%   | 1  | DET     | 08/19/95 | 1000 | 71814 | 2 | N |

| Surrogate Recovery   | Test          | Percent % | Acceptable Limits |
|----------------------|---------------|-----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 73.6*     | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 104.      | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 98.4      | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 3550           |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99984779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 2

Sample ID : 9508265-01 RA0 CH08093 SBS

M = Method Method-Description

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL         | EPI         |
|-------|-------------|-------------|
| FL    | EST15687294 | EST47287458 |
| NC    | 233         |             |
| SC    | 10120       | 10582       |
| TN    | 02934       |             |
| VA    | 00151       |             |
| WI    | 99988779    |             |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contract: Ms. Lori Keller  
Project Description: Charleston/CH

*SOIL SAMPLE  
TANK GROUP #4  
AT NSY Block 236.  
DISCOLORED SOIL  
FROM SIDEWALL OF  
EXCAVATION. Tank 9*

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 3

Sample ID : CH08094 SBS  
Lab ID : 9508265-02  
Matrix : SBS  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |     |     |       |    |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i>               |           |        |     |     |       |    |         |          |      |       |   |   |
| Benzene   | J         | 0.1    | 3   | 14  | ug/kg | 1  | TLD     | 08/24/95 | 1834 | 71677 | 1 | 1 |
| Ethylbenzene  | J         | 0.2    | 3   | 14  | ug/kg | 1  |         |          |      |       |   |   |
| Naphthalene   | JB        | 1      | 3   | 14  | ug/kg | 1  |         |          |      |       |   |   |
| Toluene   | J         | 8      | 3   | 14  | ug/kg | 1  |         |          |      |       |   |   |
| o- and para-Xylenes                                 | J         | 0.4    | 3   | 14  | ug/kg | 1  |         |          |      |       |   |   |
| m-Xylene  | J         | 0.2    | 3   | 14  | ug/kg | 1  |         |          |      |       |   |   |
| <b>Organic Prep</b>                                 |           |        |     |     |       |    |         |          |      |       |   |   |
| Evaporative Loss @ 105 C                            |           | 28     | 1   | 1   | wt%   | 1  | DDT     | 08/19/95 | 1000 | 71274 | 2 | 2 |
| <b>Extractable Organics</b>                         |           |        |     |     |       |    |         |          |      |       |   |   |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> |           |        |     |     |       |    |         |          |      |       |   |   |
| 1-Methylnaphthalene                                 | U         | 460    | 460 | 460 | ug/kg | 1  | JCB     | 08/25/95 | 2239 | 71625 | 3 | 3 |
| 2-Methylnaphthalene                                 | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Acenaphthene  | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Acenaphthylene                                      | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Anthracene  | J         | 63     | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(ghi)perylene                                  | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Chrysene  | J         | 82     | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Dibenzo(a,h)anthracene                              | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Fluoranthene  | J         | 220    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Fluorene  | J         | 62     | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Naphthalene   | U         | 460    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |
| Phenanthrene  | J         | 250    | 230 | 460 | ug/kg | 1  |         |          |      |       |   |   |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 3

Sample ID : CH08094 SBS

| Parameter                      | Qualifier | Result | DL   | RL   | Units | DF | Analyst | Date     | Time | Batch | M | C |
|--------------------------------|-----------|--------|------|------|-------|----|---------|----------|------|-------|---|---|
| Pyrene                         | I         | 180    | 230  | 460  | ug/kg | 1  |         |          |      |       |   |   |
| Metals Analysis                |           |        |      |      |       |    |         |          |      |       |   |   |
| Silver                         | U         | 0.50   | 0.50 | 2    | mg/kg | 1  | JSS     | 08/22/95 | 1234 | 71339 | 4 | 3 |
| Arsenic                        | B         | 7.5    | 2.7  | 19.2 | mg/kg | 1  |         |          |      |       |   |   |
| Barium                         |           | 42.0   | 0.20 | 2    | mg/kg | 1  |         |          |      |       |   |   |
| Cadmium                        | U         | 0.21   | 0.21 | 2    | mg/kg | 1  |         |          |      |       |   |   |
| Chromium                       |           | 31.6   | 0.30 | 2    | mg/kg | 1  |         |          |      |       |   |   |
| Lead                           |           | 76.6   | 2.4  | 6.4  | mg/kg | 1  |         |          |      |       |   |   |
| Selenium                       | U         | 5.4    | 5.4  | 19.2 | mg/kg | 1  |         |          |      |       |   |   |
| Mercury                        |           | 0.61   | 0.03 | 0.04 | mg/kg | 1  | BBJ     | 08/24/95 | 1815 | 71296 | 5 | 4 |
| General Chemistry              |           |        |      |      |       |    |         |          |      |       |   |   |
| Total Rec. Petro. Hydrocarbons |           | 644    | 13.9 | 13.9 | mg/kg | 1  | CAM     | 08/22/95 | 1130 | 71459 | 6 | 2 |

The following prep procedures were performed:

GC/MS Base/Neural Compounds

ICP

Mercury

CPU 08/24/95 1430 71625 3

DVW 08/19/95 1010 71339 7

BBJ 08/22/95 1600 71296 5

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl     | M610-BECH     | 89.2     | (36.0 - 114.)     |
| Nitrobenzene-d5      | M610-BECH     | 72.2     | (23.0 - 120.)     |
| p-Terphenyl-d14      | M610-BECH     | 82.6     | (51.8 - 135.)     |
| Bromofluorobenzene   | BTEX/NAP-8260 | 61.4*    | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 110.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 102.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 3550           |
| M 3        | EPA 8270           |



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99983739     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 3 of 3

Sample ID : CH08094 SBS

### M = Method Method-Description

|     |           |
|-----|-----------|
| M 4 | EPA 6010A |
| M 5 | EPA 7471  |
| M 6 | EPA 9071  |
| M 7 | EPA 3050  |

### C = Container Lab. Container ID Reference ID

|     |               |           |
|-----|---------------|-----------|
| C 1 | 9508265-02.03 | CH0809401 |
| C 2 | 9508265-02.01 | CH0809402 |
| C 3 | 9508265-02.02 | CH0809404 |
| C 4 | 9508265-02.04 | CH0809403 |

### Notes:

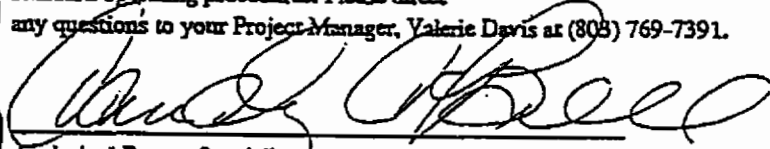
The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | EX7156/87294 | EX7472/87451 |
| NC    | 223          |              |
| SC    | 10120        | 10382        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988279     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 2

Sample ID : 9508265-02 RA1 CH08094 SBS  
Lab ID : 9508265-07  
Matrix : Soil  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |    |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |    |         |          |      |       |   |   |
| Benzene                               | J         | 0.1    | 3  | 14 | ug/kg | 1  | TLD     | 08/25/95 | 2044 | 71747 | 1 | N |
| Ethylbenzene                          | J         | 0.1    | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| Naphthalene                           | U         | 14     | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| Toluene                               | J         | 3      | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| meta- and para-Xylenes                | J         | 0.3    | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| ortho-Xylene                          | J         | 0.1    | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |    |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 28     | 1  | 1  | wt%   | 1  | DDT     | 08/19/95 | 1000 | 71814 | 2 | N |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 48.4*    | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 106.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 112.     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 3550           |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 2

Sample ID : 9508265-02 RA1 CH08094 SBS

M = Method Method-Description

### Notes:

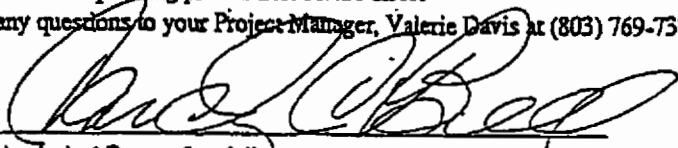
The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

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in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | EX7156/87294 | EX7472/87438 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988778     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 2

Sample ID : 9508265-02 RAO CH08094 SBS  
Lab ID : 9508265-08  
Matrix : SBS  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |    |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |    |         |          |      |       |   |   |
| Benzene                               | U         | 14     | 3  | 14 | ug/kg | 1  | TLD     | 08/25/95 | 2014 | 71747 | 1 | N |
| Ethylbenzene                          | U         | 14     | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| Naphthalene                           | U         | 14     | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| Toluene                               | J         | 0.3    | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| meta- and para-Xylenes                | U         | 14     | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 14     | 3  | 14 | ug/kg | 1  |         |          |      |       |   |   |
| <b>Organic Prep</b>                   |           |        |    |    |       |    |         |          |      |       |   |   |
| Evaporative Loss @ 105 C              |           | 28     | 1  | 1  | wt%   | 1  | DDT     | 08/19/95 | 1000 | 71814 | 2 | N |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 76.8*    | (80.0 - 120.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 104.     | (80.0 - 120.)     |
| Toluene-d8           | BTEX/NAP-8260 | 93.6     | (80.0 - 120.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 3550           |

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# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPH          |
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WT    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 2

Sample ID : 9508265-02 RAO CH08094 SBS

M = Method

Method-Description

### Notes:

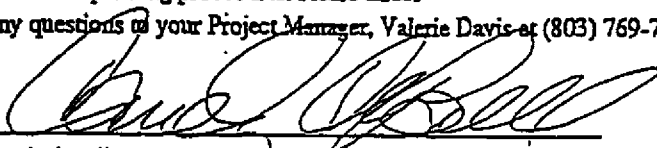
The qualifiers in this report are defined as follows:

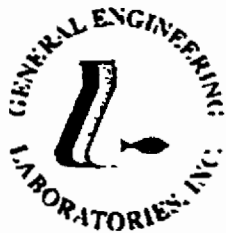
J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

|       |              |              |
|-------|--------------|--------------|
| STATE | GEL          | EPI          |
| FL    | ES7156/87294 | ES7472/87145 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99983779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 4

Sample ID : CH08095 GWT  
Lab ID : 9508265-03  
Matrix : GWT  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL  | RL  | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|-----|-----|-------|-----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>                            |           |        |     |     |       |     |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i>               |           |        |     |     |       |     |         |          |      |       |   |   |
| Benzene   | UX        | 500    | 250 | 500 | ug/l  | 200 | TLD     | 08/26/95 | 0043 | 71748 | 1 |   |
| Ethylbenzene  | UX        | 500    | 250 | 500 | ug/l  | 200 |         |          |      |       |   |   |
| Naphthalene   | IXB       | 300    | 250 | 500 | ug/l  | 200 |         |          |      |       |   |   |
| Toluene   | IXB       | 12     | 250 | 500 | ug/l  | 200 |         |          |      |       |   |   |
| meta- and para-Xylenes                              | UX        | 500    | 250 | 500 | ug/l  | 200 |         |          |      |       |   |   |
| ortho-Xylene  | UX        | 500    | 250 | 500 | ug/l  | 200 |         |          |      |       |   |   |
| Methyl Tert Butyl Ether                             | UX        | 500    | 250 | 500 | ug/l  | 200 |         |          |      |       |   |   |
| <b>Extractable Organics</b>                         |           |        |     |     |       |     |         |          |      |       |   |   |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> |           |        |     |     |       |     |         |          |      |       |   |   |
| 1-Methylnaphthalene                                 | UX        | 10     | 10  | 10  | ug/l  | 1   | TNF     | 08/19/95 | 1107 | 71188 | 2 | 1 |
| 2-Methylnaphthalene                                 | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Acenaphthene  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Acenaphthylene                                      | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Anthracene  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Benzo(ghi)perylene                                  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Chrysene  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Dibenzo(a,h)anthracene                              | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Fluoranthene  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Fluorene  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Naphthalene   | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Phenanthrene  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |
| Pyrene  | UX        | 10     | 5   | 10  | ug/l  | 1   |         |          |      |       |   |   |



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 4

Sample ID : CH08095 GWT

| Parameter                      | Qualifier | Result | DL   | RL   | Units | DF | Analyst | Date     | Time | Batch | M | C |
|--------------------------------|-----------|--------|------|------|-------|----|---------|----------|------|-------|---|---|
| <b>Metals Analysis</b>         |           |        |      |      |       |    |         |          |      |       |   |   |
| Arsenic                        |           | 29.6   | 1.0  | 5    | ug/l  | 1  | RMJ     | 08/17/95 | 1749 | 70923 | 3 | 2 |
| Lead                           | X         | 80.3   | 1.0  | 5    | ug/l  | 1  | RMJ     | 08/17/95 | 2045 | 70923 | 4 | 2 |
| Selenium                       |           | 5.7    | 1.0  | 5    | ug/l  | 1  | RMJ     | 08/17/95 | 1607 | 70923 | 5 | 2 |
| Silver                         | U         | 7.8    | 7.8  | 30   | ug/l  | 1  | JSS     | 08/22/95 | 1305 | 71386 | 6 | 2 |
| Barium                         |           | 132    | 2.2  | 30   | ug/l  | 1  |         |          |      |       |   |   |
| Cadmium                        | U         | 3.3    | 3.3  | 5    | ug/l  | 1  |         |          |      |       |   |   |
| Chromium                       |           | 112    | 4.2  | 30   | ug/l  | 1  |         |          |      |       |   |   |
| Mercury                        | B         | 0.11   | 0.10 | 0.20 | ug/l  | 1  | DVW     | 08/23/95 | 0731 | 71396 | 7 | 2 |
| <b>General Chemistry</b>       |           |        |      |      |       |    |         |          |      |       |   |   |
| Total Rec. Petro. Hydrocarbons | E         | 11800  | 1000 | 1000 | ug/l  | 1  | MCM     | 08/22/95 | 1500 | 71276 | 8 | 3 |

The following prep procedures were performed:

GC/MS Base/Neutral Compounds

Graphite Furnace

ICP

Mercury

CPU 08/17/95 1430 71188 9

DVW 08/14/95 1200 70923 10

FGD 08/21/95 1700 71386 11

BBJ 08/21/95 2100 71396 7

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| 2-Fluorobiphenyl     | M610-BECH     | 0.00*    | (50.4 - 114.)     |
| Nitrobenzene-d5      | M610-BECH     | 0.00*    | (35.0 - 107.)     |
| p-Terphenyl-d14      | M610-BECH     | 0.00*    | (33.0 - 130.)     |
| Bromofluorobenzene   | BTEX/NAP-8260 | 84.2*    | (97.8 - 117.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 103.     | (78.5 - 118.)     |
| Toluene-d8           | BTEX/NAP-8260 | 91.4*    | (92.9 - 110.)     |
| Bromofluorobenzene   | MTBE-8260     | 84.2*    | (97.8 - 117.)     |
| Dibromofluoromethane | MTBE-8260     | 103.     | (78.5 - 118.)     |
| Toluene-d8           | MTBE-8260     | 91.4*    | (92.9 - 110.)     |



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 3 of 4

Sample ID : CH08095 GWT

| M = Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |
| M 2        | EPA 8270           |
| M 3        | EPA 7060           |
| M 4        | EPA 7421           |
| M 5        | EPA 7740           |
| M 6        | EPA 6010A          |
| M 7        | EPA 7470           |
| M 8        | EPA 418.1          |
| M 9        | EPA 3500/3520      |
| M 10       | EPA 3020           |
| M 11       | EPA 3005           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C 1           | 9508265-03.03     | CH0809509    |
| C 2           | 9508265-03.01     | CH0809511    |
| C 3           | 9508265-03.04     | CH0809510    |

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | ES7156/87294 | ES7472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99983779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 4 of 4

Sample ID : CH08095 GWT

C = Container

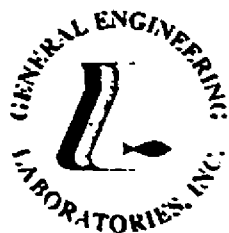
Lab. Container ID

Reference ID

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | QEL          | EPI          |
|-------|--------------|--------------|
| FL    | 887156/87294 | 887472/87453 |
| NC    | 233          |              |
| SC    | 10820        | 10582        |
| TN    | 02834        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 3

Sample ID : 9508265-03 DL1 CH08095 GWT  
Lab ID : 9508265-04  
Matrix : GWT  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter   | Qualifier | Result | DL     | RL     | Units | DF  | Analyst | Date     | Time | Batch | M | C |
|---|-----------|--------|--------|--------|-------|-----|---------|----------|------|-------|---|---|
| <b>Extractable Organics</b>                         |           |        |        |        |       |     |         |          |      |       |   |   |
| <i>Polynuclear Aromatic Hydrocarbons - 18 items</i> |           |        |        |        |       |     |         |          |      |       |   |   |
| 1-Methylnaphthalene                                 | U         | 980    | 980    | 980    | ug/l  | 100 | WAM     | 08/24/95 | 1753 | 71188 | 1 |   |
| 2-Methylnaphthalene                                 | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Acenaphthene  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Acenaphthylene                                      | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Anthracene  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Benzo(a)anthracene                                  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Benzo(a)pyrene                                      | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Benzo(b)fluoranthene                                | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Benzo(g,h,i)perylene                                | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Benzo(k)fluoranthene                                | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Chrysene  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Dibenzo(a,h)anthracene                              | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Fluoranthene  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Fluorene  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Indeno(1,2,3-c,d)pyrene                             | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Naphthalene   | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Phenanthrene  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| Pyrene  | U         | 980    | 500    | 980    | ug/l  | 100 |         |          |      |       |   |   |
| <b>Metals Analysis</b>                              |           |        |        |        |       |     |         |          |      |       |   |   |
| Lead  | D         | 87.9   | 2.0    | 10     | ug/l  | 2   | RMJ     | 08/18/95 | 1602 | 70923 | 2 | 1 |
| <b>General Chemistry</b>                            |           |        |        |        |       |     |         |          |      |       |   |   |
| Total Rec. Petro. Hydrocarbons                      |           | 273000 | 100000 | 100000 | ug/l  | 100 | MCM     | 08/22/95 | 1500 | 71276 | 3 | 1 |

The following prep procedures were performed:

GC/MS Base/Neutral Compounds  
Graphite Furnace

CPU 08/17/95 1430 71188 4  
DVW 08/14/95 1200 70923 5





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 3

Sample ID : 9508265-03 DL1 CH08095 GWT

| Surrogate Recovery | Test      | Percent% | Acceptable Limits |
|--------------------|-----------|----------|-------------------|
| 2-Fluorobiphenyl   | M610-BECH | 0.00*    | (50.4 - 114.)     |
| Nitrobenzene-d5    | M610-BECH | 0.00*    | (35.0 - 107.)     |
| p-Terphenyl-d14    | M610-BECH | 0.00*    | (33.0 - 130.)     |

| M = Method | Method-Description |
|------------|--------------------|
| M1         | EPA 8270           |
| M2         | EPA 7421           |
| M3         | EPA 418.1          |
| M4         | EPA 3500/3520      |
| M5         | EPA 3020           |

| C = Container | Lab. Container ID | Reference ID |
|---------------|-------------------|--------------|
| C1            | 9508265-04.01     | CH0809201    |

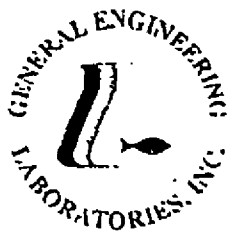
### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)





# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller

Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 3 of 3

Sample ID : 9508265-03 DL1 CH08095 GWT

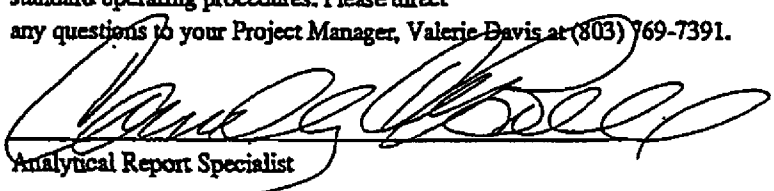
C = Container

Lab. Container ID

Reference ID

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed  
in accordance with General Engineering Laboratories  
standard operating procedures. Please direct  
any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# GENERAL ENGINEERING LABORATORIES

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## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | BS7156/87294 | BS7472/87438 |
| NC    | 233          |              |
| SC    | 10120        | 10382        |
| TN    | 02934        |              |
| VA    | 08131        |              |
| WI    | 99903779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350  
Contact: Ms. Lori Keller  
Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 1 of 2

Sample ID : 9508265-03 RAO CH08095 GWT  
Lab ID : 9508265-09  
Matrix : GWT  
Date Collected : 08/10/95  
Date Received : 08/10/95  
Priority : Routine  
Collector : Client

| Parameter                             | Qualifier | Result | DL | RL | Units | DF | Analyst | Date     | Time | Batch | M | C |
|---------------------------------------|-----------|--------|----|----|-------|----|---------|----------|------|-------|---|---|
| <b>Volatile Organics</b>              |           |        |    |    |       |    |         |          |      |       |   |   |
| <i>BTEX and Naphthalene - 6 items</i> |           |        |    |    |       |    |         |          |      |       |   |   |
| Benzene                               | J         | 1      | 1  | 2  | ug/l  | 1  | DLS     | 09/01/95 | 1530 | 72551 | 1 | N |
| Ethylbenzene                          | U         | 2      | 1  | 2  | ug/l  | 1  |         |          |      |       |   |   |
| Phthalene                             | U         | 2      | 1  | 2  | ug/l  | 1  |         |          |      |       |   |   |
| Toluene                               | JB        | 0.2    | 1  | 2  | ug/l  | 1  |         |          |      |       |   |   |
| meta- and para-Xylenes                | J         | 0.1    | 1  | 2  | ug/l  | 1  |         |          |      |       |   |   |
| ortho-Xylene                          | U         | 2      | 1  | 2  | ug/l  | 1  |         |          |      |       |   |   |
| Methyl Tert Butyl Ether               | U         | 2      | 1  | 2  | ug/l  | 1  |         |          |      |       |   |   |

| Surrogate Recovery   | Test          | Percent% | Acceptable Limits |
|----------------------|---------------|----------|-------------------|
| Bromofluorobenzene   | BTEX/NAP-8260 | 96.6*    | (97.8 - 117.)     |
| Dibromofluoromethane | BTEX/NAP-8260 | 110.     | (78.5 - 118.)     |
| Toluene-d8           | BTEX/NAP-8260 | 93.2     | (92.9 - 110.)     |
| Bromofluorobenzene   | MTBE-8260     | 96.6*    | (97.8 - 117.)     |
| Dibromofluoromethane | MTBE-8260     | 110.     | (78.5 - 118.)     |
| Toluene-d8           | MTBE-8260     | 93.2     | (92.9 - 110.)     |

| M - Method | Method-Description |
|------------|--------------------|
| M 1        | EPA 8260           |

43



# GENERAL ENGINEERING LABORATORIES

Meeting today's needs with a vision for tomorrow.

## Laboratory Certifications

| STATE | GEL          | EPI          |
|-------|--------------|--------------|
| FL    | E87156/87294 | E87472/87458 |
| NC    | 233          |              |
| SC    | 10120        | 10582        |
| TN    | 02934        |              |
| VA    | 00151        |              |
| WI    | 99988779     |              |

## CERTIFICATE OF ANALYSIS

Client: Bechtel  
PO Box 350  
Oak Ridge, Tennessee 37831-0350

Contact: Ms. Lori Keller

Project Description: Charleston/CH

cc: BECH00594

Report Date: October 03, 1995

Page 2 of 2

Sample ID : 9508265-03 RAO CH08095 GWT

M = Method

Method-Description

### Notes:

The qualifiers in this report are defined as follows:

J indicates presence of analyte between DL (Detect Limit) and RL (Report Limit)

U indicates presence of analyte < DL (Detect Limit)

Data reported in mass/mass units is reported as 'dry weight'.

This data report has been prepared and reviewed in accordance with General Engineering Laboratories standard operating procedures. Please direct any questions to your Project Manager, Valerie Davis at (803) 769-7391.

  
Analytical Report Specialist



# CHAIN OF CUSTODY RECORD (Continued)

Page 2 of 2

| Station ID | BEI Sample ID | Sample Type | Matrix Code | Collection Date/Time | Container ID       | Preservative           | Pay Item        | Parameter                    | Priority | QC Level |
|------------|---------------|-------------|-------------|----------------------|--------------------|------------------------|-----------------|------------------------------|----------|----------|
| 236-9      | CH-08-094     | ENV         | SBS         | 10 AUG 95 / 1750     | -01, -02, -03, -04 | 4°C                    | 6.54            | BZES BTBX NAPHTHALENE        | 14 DAY   | C        |
|            |               |             |             |                      | -02                |                        | 10.63           | TRPH                         |          |          |
|            |               |             |             |                      | -03                |                        | 7.14            | PAH                          |          |          |
|            |               |             |             |                      | -04                |                        | 9.36            | TCIA METALS                  |          |          |
| 236-9      | CH08095       | ENV         | GLT         | 10 AUG 95 / 1725     | -01, -02, -03      | 1.57 / 1.41            | HCl, 4°C        | BZES BTBX, MIXED NAPHTHALENE | 14 DAY   | C        |
|            |               |             |             |                      | -04, -05, -06      | HCl, 4°C               | 1.55            | BZES BTBX NAPHTHALENE        |          |          |
|            |               |             |             |                      | -07, -08           | 4°C                    | 2.15            | PAH                          |          |          |
|            |               |             |             |                      | -09, -10           | 4°C                    | 5.63            | TRPH                         |          |          |
|            |               |             |             |                      | -11                | HNO <sub>3</sub> , 4°C | 4.34            | TCIA METALS                  |          |          |
|            |               |             |             |                      |                    | <del>HCl, 4°C</del>    | <del>1.41</del> | <del>W/D</del>               |          |          |

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## Page 1 of 2



SEIR No.: CH-004  
COC Number: CH00062  
Lab: GFL  
Field Logbook No.: CH-GH-002  
Logbook Pg. No.: 22-28

**Print**

## Stan

Print

## Sign

**SAMPLE TYPE**

## MATRIX

## QC LEVELS

|     |                |
|-----|----------------|
| PBS | Post Burn Soil |
| PTW | Potable Water  |
| SEP | Seeps          |
| SOL | Solid          |
| WWT | Waste Water    |
| SST | Surface Water  |
|     | Storm Event    |

C Sample results and QC reported  
D Sample results, QC and raw data reported  
E Sample results, blanks, and calibration reported  
S Screening level analysis: sample results and as reported

| Station ID | BEI Sample ID | Sample Type | Matrix Code | Collection Date/Time | Container ID  | Preservative | Pay Item | Parameter         | Priority | QC Code |
|------------|---------------|-------------|-------------|----------------------|---------------|--------------|----------|-------------------|----------|---------|
| —          | C1000016      | TPB         | OFW         | 01/14/95 1115        | -01, -02, -03 | HCL, 4°C     | 1.41     | FREEP H13         | 14 DAY   | C       |
| —          | C1000017      | TPB         | OFW         | 8/14/95 1118         | -01           | HCL, 4°C     | 1.55     | BTX2              | 14 DAY   | C       |
| 15-236-1   | 1-10          | ↓           | ↓           | ↓                    | -02           | ↓            | ↓        | MAPPIALAE         | ↓        | ↓       |
| 15-236-6   | 6-10          | ENV         | SSS         | 9/14/95 1145         | -01           | 4°C          | 6.54     | BTX2<br>NACALALAE | 14 DAY   | C       |
|            |               |             |             |                      | -01           | ↓            | 6.40     | FREEP H13         | ↓        | ↓       |
|            |               |             |             |                      | -02           | ↓            | 7.14     | DAH               | ↓        | ↓       |

| RELINQUISHED BY | RECEIVED BY      | DATE    | TIME  | REASON FOR TRANSFER | COMMENTS/INSTRUCTIONS   |
|-----------------|------------------|---------|-------|---------------------|---|
| [Signature]     | Kashwa U. Nibblu | 8-15-95 | 17115 | TRANSFER TO LAS     | -TRIP BLANK PREPARED BY GEL<br>8/19/95 @ OGB Camps<br><br>-USE METHOD NO 8200 FOR STEPS/METHODS |
|                 |                  |         |       |                     |   |
|                 |                  |         |       |                     |   |
|                 |                  |         |       |                     |   |
|                 |                  |         |       |                     |   |
|                 |                  |         |       |                     |   |
|                 |                  |         |       |                     |   |
|                 |                  |         |       |                     |   |
|                 |                  |         |       |                     |   |

| CONTAMINATION | YES                                   | NO                                    |
|---------------|---------------------------------------|---------------------------------------|
| Radiological  | <input type="checkbox"/>              | <input checked="" type="checkbox"/> X |
| Chemical      | <input checked="" type="checkbox"/> X | <input type="checkbox"/>              |

2000

2

—11A.

-111-

**This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.o.s. UN2910**

**This package conforms to the conditions and limitations specified in 49 CFR 173.42 for excepted radioactive material, limited quantity, n.o.s., UN2910.**

01/01/1994

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REC-ITEL ENV

PAGE 04

**CHAIN OF CUSTODY RECORD (Continued)** *COC# CH00062*

Page 2 of 2

|        | Station ID | BEl Sample ID | Sample Type | Matrix Code | Collection Date/Time | Container ID | Preservative | Pey Item | Parameter         | Priority | QC Level |
|--------|------------|---------------|-------------|-------------|----------------------|--------------|--------------|----------|-------------------|----------|----------|
| CNS-   | -236-6     | CH0809B       | ENV         | SBS         | 3/14/75 1145         | -02          | 4°C          | 10.63    | TRPH.             | 14 DAY   | C        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | 4°C          | 7.36     | RCA Metals        | ↓        | ↓        |
| (CNS)- | -236-2     | J110EXN)      | ENV         | SBS         | 3/14/75 1520         | -01          | 4°C          | 6.54     | Diox Naphthalenes | 14 DAY   | C        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -01          | ↓            | 6.40     | FREDD IIS         | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 7.14     | PAH               | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 10.63    | TRPM              | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 9.36     | RCA Metals        | ↓        | ↓        |
| (CNS)- | -236-2     | CH0810D       | ENV         | SBS         | 3/14/75 1525         | -01          | 4°C          | 6.54     | Diox Naphthalenes | 14 DAY   | C        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -01          | ↓            | 6.40     | FREDD IIS         | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 7.14     | PAH               | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 10.63    | TRPM              | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 9.36     | RCA METALS        | ↓        | ↓        |
| (CNS)- | -236-3     | CH0810I       | ENV         | SBS         | 3/15/75 0710         | -01          | 4°C          | 6.54     | Diox Naphthalenes | 14 DAY   | C        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -01          | ↓            | 6.40     | FREDD IIS         | 14 DAY   | C        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 7.14     | PAH               | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 10.63    | TRPM              | ↓        | ↓        |
|        | ↓          | ↓             | ↓           | ↓           | ↓                    | -02          | ↓            | 9.36     | RCA METALS        | ↓        | ↓        |
| CNS-   | -236-7     | CH0810Z       | ENV         | SBS         | 3/14/75 1456         | -01,-02      | 4°C          | 6.40     | FREDD IIS         | 14 DAY   | L        |
| CNS-   | -236-7     | CH0810S       | ENV         | SBS         | 3/14/75 1503         | -01,-02      | 4°C          | 6.40     | FREDD IIS         | 14 DAY   | C        |

# CHAIN OF CUSTODY RECORD

Page 1 of 2



Facility Name: CHARLESTON NAVAL SHIPYARD  
 Site Name: BLDG 236  
 Delivery Order No.: 112  
 Cooler/Crate No.: 222  
 Sampling Event: UST REMOVAL

SEIR No.: CH-004  
 COC Number: CH00063  
 Lab.: GENERAL ENGINEERING LABORATORY  
 Field Logbook No.: 01-CH-002  
 Logbook Pg. No.: 27-32

Sampled by: Joe W. Duncan Print [Signature] Sign

| Legend |                        | SAMPLE TYPE |                 | MATRIX |                              | QC LEVELS |                       |
|--------|------------------------|-------------|-----------------|--------|------------------------------|-----------|-----------------------|
| PSB    | Preservative Blank     | BLS         | Blind Spike     | AIR    | Air                          | SBS       | Subsurface Soil (>6") |
| FDP    | Field Duplicate        | BLB         | Blank Blank     | FLO    | Flora                        | SED       | Sediment              |
| ENV    | Environmental          | PTS         | Point Source    | FAU    | Fauna                        | SFS       | Surface Soil (0-6")   |
| FDB    | Field Blank            | FRP         | Field Replicate | GWT    | Groundwater                  | SPW       | Surface Water         |
| GEO    | Geotechnical Sample    | RSB         | Rinsate Blank   | LCH    | Leachate                     | SLG       | Sludge                |
| MXD    | Matrix Spike Duplicate | SPL         | Spill           | OIL    | Oil                          | SLW       | Solid Waste           |
| MXS    | Matrix Spike           | TPB         | Trip Blank      | DIW    | Deionized Water              | OFW       | Organic Free Water    |
|        |                        |             |                 | OPW    | Deionized Organic Free Water | PBS       | Post Burn Soil        |
|        |                        |             |                 |        |                              | PTW       | Potable Water         |
|        |                        |             |                 |        |                              | SEP       | Seeps                 |
|        |                        |             |                 |        |                              | SOL       | Solid                 |
|        |                        |             |                 |        |                              | WWT       | Waste Water           |
|        |                        |             |                 |        |                              | SST       | Surface Water         |
|        |                        |             |                 |        |                              |           | Storm Effluent        |

| Station ID | BEI Sample ID | Sample Type | Matrix Code | Collection Date/Time | Container ID  | Preservative | Pay Item | Parameter        | Priority | QC Code |
|------------|---------------|-------------|-------------|----------------------|---------------|--------------|----------|------------------|----------|---------|
| 5-236-5    | CH00104       | TPB         | DFW         | 16AUG95/0920         | -01, -02, -03 | HCl 4°C      | 1.55     | BTEX NAPHTHALENE | 14 DAY   | C       |
| 5-236-5    | CH00108       | ENV         | SBS         | 17AUG95/0924         | -01           | 4°C          | 6.54     | BTEX NAPHTHALENE | 14 DAY   | C       |
| ↓          | ↓             | ↓           | ↓           | ↓                    | -02           | ↓            | 7.14     | PAH              | ↓        | ↓       |
| 5-236-5    | CH00109       | ENV         | SBS         | 17AUG95/0929         | -01           | 4°C          | 6.54     | BTEX NAPHTHALENE | 14 DAY   | C       |
| ↓          | ↓             | ↓           | ↓           | ↓                    | -02           | ↓            | 7.14     | PAH              | 14 DAY   | C       |

| RELINQUISHED BY | RECEIVED BY | DATE  | TIME | REASON FOR TRANSFER | COMMENTS/INSTRUCTIONS                     |
|-----------------|-------------|-------|------|---------------------|---|
| [Signature]     |             | 16AUG | 1631 |                     | GEL PREPARED TRIP BLANK 8/4/95 @ 0830 HRS |
|                 |             |       |      |                     | BTEX/NAPHTHALENE RUN BY METHOD 8260       |

| CONTAMINATION | YES | NO |
|---------------|-----|----|
| Radiological  |     | X  |
| Chemical      | X   |    |

Shipper: DEI  
 Ship to: GEL  
 Airbill No. -NA- Traffic Report No. -NA-

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.e.s. UN2910.

This package conforms to the conditions and limitations specified in 49 CFR 173.421 for excepted radioactive material, limited quantity, n.e.s. UN2910

01/01/1994 03:48 4232202108

BECHTEL ENV.

PAGE 06



### CHAIN OF CUSTODY RECORD (Continued)

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C11000263

[illegible]

**ATTACHMENT IV**  
**WASTEWATER MANIFESTS**

No. W96007**MANIFEST - NON-HAZARDOUS WASTEWATER**

|  |                             |                                      |                                   |
|--|-----------------------------|--------------------------------------|-----------------------------------|
| 1. Generator's EPA ID# (if applicable)<br><u>N/A</u>   |                             | Waste ID Number                      |                                   |
| 2. Generator's Name and Mailing Address:<br><u>CHARLESTON NAVAL SHIPYARD</u><br><u>N. CHARLESTON SC 29408</u>  |                             | Phone ( <u>803</u> ) <u>743-5579</u> |                                   |
| 3. Agent of Generator and Mailing Address:<br><u>FENN-VAC, INC</u><br><u>P.O. Box 62679</u><br><u>N. Charleston, SC 29419</u>  |                             | Phone ( <u>803</u> ) <u>552-8306</u> |                                   |
| 4. Transporter Company Name:<br><u>FENN-VAC, INC</u>   |                             | Phone ( <u>803</u> ) <u>552-8306</u> |                                   |
| Truck & Trailer License Number:  |                             |                                      |                                   |
| 5. Transporter U.S. EPA ID#:<br><u>SC0980837504</u>  |                             |                                      |                                   |
| 6. Designated Facility Name and Site Address:<br><br>Water Recovery Systems, LLC, PO Box 70791, 1500 Greenleaf Street<br>Charleston, SC 29415<br>(803) 566-7067<br>(803) 566-7066 - FAX  |                             |                                      |                                   |
| 7. Designated Facility U.S. EPA ID#:   |                             |                                      |                                   |
| 8. U.S. DOT Description (including proper shipping name, hazard class, generator name, address & contact)  | 9. Container<br>No.    Type | 10. Total Quantity                   | 11. Unit                          |
| a. <u>Non Regulated Wastewater</u>   | <u>01</u> <u>T</u>          | <u>600 gal</u>                       | <u>Gallons</u>                    |
| b.   |                             | <u>729 gal.</u>                      |                                   |
| c.   |                             |                                      |                                   |
| d.   |                             |                                      |                                   |
| 12. Generator's Certification: I hereby declare that the contents of this consignment are not hazardous by definition or listing and are fully and accurately described above by proper shipping name and are classified, packed, marked and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations and the laws of the State of South Carolina. I further certify that the contents of this consignment are as represented by the description contained on the Waste Profile Form previously submitted to and approved by the Designated Facility. |                             |                                      |                                   |
| Printed/Typed Name<br><u>Kevin T. Long</u>   |                             | Signature<br><u>[Signature]</u>      | Month Day Year<br><u>12/18/95</u> |
| 13. Transporter Acknowledgement of Receipt of Materials<br>Printed/Typed Name<br><u>James D Davis</u>  |                             | Signature<br><u>[Signature]</u>      | Month Day Year<br><u>02/14/96</u> |
| 14. Discrepancy Indication Space   |                             |                                      |                                   |
| Facility Owner or Operator: Certification of Receipt of Materials<br>Printed/Typed Name<br><u>Bobby Penner</u>   |                             | Signature<br><u>[Signature]</u>      | Month Day Year<br><u>1/4/96</u>   |



Mailing Address  
PO Box 70971  
Charleston, SC 29415  
(803) 566-7067

Shipping Address  
1500 Greenleaf Street  
Charleston, SC 29405  
FAX (803) 566-7066

Waste Approval  
Code Number

CNS 2

## NON-HAZARDOUS WASTE PROFILE FORM

### CUSTOMER INFORMATION

Generator Name: CHARLESTON NAVAL SHIPYARD

Address: N. CHARLESTON SC 29408

Phone: (803) 743-5519 Contact/Title: Kevin T. Long

Total estimated gallons: 500 600 Type and Number of containers: VACUUM TANKER

### WASTE DESCRIPTION

Flash Point: N/A Single Phased: YES Phenolics (ppm): — Physical State: Liquid

pH: 7.3 Odor: None % Free Liquids: 95-100% % Solids: 0.5%

Reactive Sulfides (ppm): 0 Cyanides (ppm): 0 Color: Clear to Brown

Process of Waste Generation: Removal of UST

### HAZARDOUS CHARACTERISTICS:

|             | Total (ppm)<br>ppb    | TCLP (ppm)<br>as requested |         | Total (ppm)      | TCLP (ppm) |
|-------------|-----------------------|----------------------------|---------|------------------|------------|
| Arsenic     | <u>16.2</u>           |                            | PCB     | <u>&lt;0.10</u>  | XXXXXX     |
| Barium      | <u>100 2950</u>       |                            | TPH     | <u>100 130</u>   | XXXXXX     |
| Cadmium     | <u>100 321.5</u>      |                            | BTEX    | <u>205 PPB</u>   | XXXXXX     |
| Chromium    | <u>100 26 119</u>     |                            | Benzene | <u>100 0.005</u> |            |
| Lead        | <u>100 21.390</u>     |                            | TOX     | <u>302 PPB</u>   | XXXXXX     |
| Mercury     | <u>0.10</u>           |                            |         |                  |            |
| Selenium    | <u>2.1 PPB</u>        |                            |         |                  |            |
| Silver      | <u>12.6</u>           |                            |         |                  |            |
| Chromium +6 | <u>100 204.6 mg/L</u> |                            |         |                  |            |

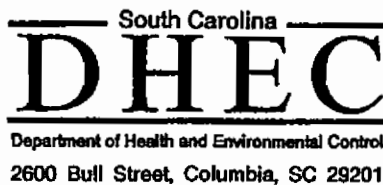
By signing this application form I certify that:

- 1.) I am the generator of the waste described on this form.
- 2.) This waste is not a regulated hazardous waste as defined by the EPA or by applicable ordinances of SC.
- 3.) This form and its attachments contain true and accurate descriptions of the waste.
- 4.) Any laboratory data used to support the validity of the data shown on this form has been obtained from the analysis of a volumetrically representative sample, obtained and analyzed according to 40 CFR 261, EPA Document SW-846, Test Methods for Evaluating Solid Waste, of exactly the same waste that I will deliver to Water Recovery Systems for treatment.
- 5.) I certify that the laboratory results listing lab name, report date, and sample ID# are attached as support to the data certified on this application.

Certified Signature

Date: 12/18/95

Print Name, Title & Employer: Kevin T. Long, ENV ENG. CNSI



OPTIONAL FORM 99 (7-90)

**FAX TRANSMITTAL**

# of pages &gt; 2

Commissioner: Dot

Board: John H. Bu  
William M.  
Roger Leaf

Promoting Health.

|                      |               |  |                    |
|----------------------|---------------|--|--------------------|
| To                   | KAREN ATCHLEY | From                                     | GABRIEL L. MAGUIRE |
| Dept/Agency          | BECHTEL       | Phone #                                  | 803-820-7300       |
| Fax #                | 423-220-2749  | Fax #                                    | 803-820-7465       |
| NSN 7540-01-317-7388 |               | 5099-101 GENERAL SERVICES ADMINISTRATION |                    |

June 3, 1996

Department of the Navy  
Naval Facilities Engineering Command  
G.A. Hutto, Environmental Engineer  
Petroleum Remediation Division  
P.O. Box 190010  
2155 Eagle Drive  
North Charleston, SC 29419-9010

RE: Charleston Naval Shipyard, Building 236  
Site ID #16459  
Tank Closure Report received February 20, 1996  
Charleston County

Dear Mr. Hutto:

The Ground Water Protection Division (GWPD) of the South Carolina Department of Health and Environmental Control (SCDHEC) has received and reviewed the referenced closure report and offers the following comments:

- 1) It appears that a release of petroleum hydrocarbons to the environment has occurred at the location of the former UST #5. However, the Department has concerns about the validity of the analytical data (see comment #2) and recommends the confirmation of the this release.
- 2) A review of the analytical data indicates that some of the samples exceeded the appropriate holding times. For example, soil sample CH08098 for BTEX was analyzed 15 days from being obtained in the field. The acceptable holding time for BTEX analysis is 14 days. Sample CH08099 was handled in the same way (15 days). In addition, some of the samples were analyzed on the last day of the acceptable holding times. Please note, the samples that exceeded their holding times are not acceptable and the ones that were analyzed at the last day are questionable.

Based on the above concerns, a potential release at UST #5 and questionable analytical results, the GWPD cannot review the referenced closure report. Therefore, the GWPD requests that this site be revisited to obtain useable data. Soil samples should be obtained from below the former tank pits. If the samples are at or below the watertable, a groundwater sample should be obtained as well. The GWPD also recommends that additional samples be obtained at the former location of tank #5 to evaluate the severity and extent of the potential release from this tank.

If the Navy proposes to utilize borings to obtain samples, please submit a plan to the GWPD so that monitoring well approvals can be issued in case these borings encounter groundwater.

If you have any questions or comments, please call me at (803) 734-5328. On all future correspondence concerning this site, please reference the Site ID number.

Sincerely,

A handwritten signature in black ink, appearing to read "Timothy A. Mettlen".

Timothy A. Mettlen, Hydrogeologist  
Assessment and Development Section  
Ground Water Protection Division  
Bureau of Drinking Water Protection

tam/BLDG236.CR

cc: Christine Sanford-Coker, Trident District EQC

---

## Appendix D

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## **A COMPREHENSIVE REVIEW OF COMMON LABORATORY ARTIFACTS DETECTED IN ENVIRONMENTAL SAMPLES FROM THE CHARLESTON NAVAL BASE**

This memo serves as a technical review of possible industrial, laboratory and field sampling uses of common laboratory chemicals that have also been detected in varying media and concentrations at the Charleston Naval Base. The purpose of this memo is to show possible paths of introduction of these chemicals into the environmental samples through various pathways. Heartland Environmental Services, Inc. did an independent literature search to supplement this memo. Heartland's text and references are featured as Attachment A. Since much of the blame for common artifacts in environmental samples is usually placed on the laboratory, a brief discussion on the role of the laboratory is needed.

Under the Resource Conservation Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) investigations, environmental samples are routinely collected by field personnel and sent to analytical laboratories for analysis to determine if contaminants of concern are present and at significant concentrations to pose a risk to either human or ecological assessments. Laboratories selected to analyze environmental samples often go through intensive laboratory auditing processes either by the client's representatives or by individual government agencies or its appointee to assess a laboratory's capabilities. After successful completion of the audit and successful analysis of performance evaluation (PE) samples, the laboratory will become certified or given a stamp of approval. The laboratory then performs laboratory analysis of samples using regulated methods promulgated throughout the United States.

The RCRA methods commonly called SW-846 and the CERCLA methods called CLP, give step by step instructions on how a laboratory must follow the laboratory procedures. Built into these methods are quality controls and standards a laboratory must adhere to in order for data to be acceptable. A laboratory must make every effort to meet these quality control requirements or face the possibility of the data not being acceptable or non compliant by a data validator. When the laboratory has shown through data validation that the data is compliant but unexplainable results show up for chemicals like acetone, methylene chloride, and bis(2-Ethylhexyl)phthalate (BEHP), a more thorough review of the data is needed.

It is the objective of the data user to try to understand the usage of these chemicals. The where and why of common contaminants being detected also needs to be explained before a judgement can be made of the data. In that respect historical data plays a very important role in determining the usefulness of the data and understanding how the laboratory operates supplements that role. But normal standard operating procedures of laboratory and field personnel can lead to contamination of samples with acetone, methylene chloride and BEHP.

Acetone and methylene chloride are parameters listed in USEPA SW-846 method 8260 and USEPA CLP volatile organic analysis method. Both chemicals are used throughout the laboratory in extraction and cleanup solvents (VOA methods do not use extraction and cleanup procedures)



for soils and water samples. Acetone, derived from the oxidation of isopropyl alcohol, is used primarily in industry in paints, varnish, and lacquer solvent. A laboratory will use acetone to dissolve semivolatile compounds for stock standard solutions for method SW-846 8270 and in a solvent solution (300ml 1:1) with either methylene chloride or hexane used in sample quantitative extraction methods for soils. The EPA approved extraction methods that a laboratory uses for soils/solids samples are solid phase, soxhlet, pressurized fluid, and ultrasonic. Analytical clean up procedures, used to help eliminate sample interference and false positives and negatives, such as alumina, florisil, silica, acid-base partition, and sulfur also use acetone as an extraction solvent (100 ml). Specifically to the Charleston Naval Base, acetone is used in extractions of solids for methods 8080A, 8081A, 8082 (pesticides and PCBs) 8141A (organophosphorus pesticides), 8150B (herbicides) and 8270C (semivolatiles).

Methylene chloride, derived from the chlorination of methyl chloride, is used primarily in industry in paint removers and solvent degreasing. A laboratory uses methylene chloride to prepare the Gas Chromatography/ Mass Spectrometry (GC/MS) tuning standard for method 8270, as a solvent solution with acetone (300 ml total solvent at 1:1 for each sample) used in sample quantitative extraction methods for soils and as a stand alone solvent (500 ml) for water samples. The EPA approved extraction methods that a laboratory uses for water samples are liquid-liquid, continuous liquid-liquid, and solid phase. Methylene chloride is used in sample analytical clean up procedures such as alumina, florisil, silica gel, gel permeation, and acid-base partition (100 m which help to eliminate interferences.

Methylene chloride is used as a precleaning agent for sodium sulfate which is used after every extraction and cleanup procedure as a drying agent to remove moisture from extracts. Methylene chloride is also used as a rinse for the polytetrafluoroethylene (PTFE) boiling chips needed to help concentrate down the volumes of extraction and cleanup solvents produced for every sample to the correct volume. Both the sodium sulfate and the boiling chips are to be dried in an oven for several hours before usage and stored in glass containers and not plastic to prevent cross contamination from BHEP. Specifically to the Charleston Naval Base, methylene chloride is used in extractions of liquids for methods 8080A, 8081A, 8082 (pesticides and PCBs) 8141A (organophosphorus pesticides), 8150B (herbicides), 8270C (semivolatiles), and 8290 (dioxin). Another possible pathway of methylene chloride contamination according to method 8260A is "Laboratory clothing worn by the analyst should be clean, since clothing previously exposed to methylene chloride fumes during liquid/liquid extraction procedures can contribute to sample contamination." As an additional precaution it is extremely important that air ventilation systems do not lead between the extraction labs and volatile analysis labs as acetone and methylene chloride will contaminate samples.

BEHP is derived from the reaction of 2-ethylhexanol and phthalic anhydride and is used in industry as a plasticizer for many resins and elastomers and as a liquid in vacuum pumps. Laboratories do not use BEHP for any extractions or as a cleanup agent but BEHP can come

contact with environmental samples in other ways. If sample containers have plastic lids instead of screw caps lined with Teflon septas, possible contamination from phthalates (BEHP) can be seen in the samples. As noted in method 8080A of the USEPA SW-846 Test Methods, other phthalate interferences are discussed as follows "Interferences by phthalate esters can pose a major problem in pesticide determinations when using the electron capture detector. These compounds generally appear in the chromatogram as large late-eluting peaks, especially in the 15% and 50% fractions from Florisil clean-up. Common flexible plastics contain varying amounts of phthalates. These phthalates are easily extracted or leached from such materials during laboratory operations. Cross contamination of clean glassware routinely occurs when plastics are handled during extraction steps, especially when solvent-wetted surfaces are handled. Interferences from phthalates can best be minimized by avoiding contact with any plastic materials. Exhaustive cleanup of reagents and glassware may be required to eliminate background phthalate contamination." Method 8061A (Phthalate Esters by Gas Chromatography) goes into further detail discussing Soxhlet extractors and possible cross contamination in using them. "If Soxhlet extractors are baked in the muffle furnace, care must be taken to ensure that they are dry. Thorough rinsing with hot tap water, followed by deionized water and acetone, is not an adequate decontamination procedure. Even after a Soxhlet extractor was refluxed with acetone for three days, with daily solvent changes, the concentration of bis(2-Ethylhexyl)phthalate was as high as 500 ng per washing. Storage of glassware in the laboratory introduces contamination, even if the glassware is wrapped in aluminum foil. Therefore, any glassware used in Method 8061 should be cleaned immediately prior to use". The method goes on to state that "Florisil and alumina may be contaminated with phthalate esters and, therefore, use of these materials in sample cleanup should be employed cautiously. Washing of these materials prior to use with the solvent(s) used for elution during extract cleanup was helpful, however, heating at 320°C for Florisil and 210°C for alumina is recommended. Phthalate esters were detected in Florisil cartridge method blanks at concentrations ranging from 10 to 460 ng, with 5 phthalate esters in the 105 to 460 ng range. Complete removal of the phthalate esters from Florisil cartridges does not seem possible, and it is therefore desirable to keep the steps involved in sample preparation to a minimum." As with acetone and methylene chloride, BEHP may have pathways of contamination inadvertently leading to environmental samples if extreme caution and care are not taken in the laboratory to prevent them. Pathways of possible contamination do not solely belong to the laboratory. Field sampling procedures need to be scrutinized in depth as well to help eliminate cross contamination.

Field sampling procedures may lead to possible contamination of samples. Plastic sheeting and gloves are routinely used to keep both the sampling area and field personnel contaminate free but caution needs to be taken to prevent cross contamination to samples. Sampling tools such as stainless steel trowels, teflon trowels and teflon tubing should remain covered with aluminum foil until the point of sampling so as not to come in contact with the plastic sheeting. When wearing plastic gloves the sampler needs to use extra caution so that none of the sample comes in contact

with the glove as the sample bottle is being filled and possibly causing a cross contamination with phthalates.

It is also necessary to follow proper sampling decontamination procedures to help prevent cross contamination. Though there are no solvents used for decontamination on the Charleston Naval Base that are listed on the VOA method list, isopropyl alcohol is used as a solvent rinse on sampling equipment as described in the CSAP. Extreme caution needs to be taken when using isopropyl alcohol for decontamination. When using isopropyl alcohol as a rinse after Alconox detergent and DI water wash, the alcohol must be thoroughly rinsed with DI water and allowed to completely dry before additional samples are taken. If too much alcohol is used, or too little DI water for a final rinse, samples can show increased levels of acetone when analyzed.

A base wide review of the data showed acetone was randomly showing up in samples throughout the Naval Base. To help narrow down the possible routes of exposure of acetone to the samples, a decontamination experiment was conducted in the Fall of 1996 and blind samples were collected and sent to Southwest Laboratories to be analyzed.

Three blind soil samples and one water sample spiked with isopropyl alcohol were sent to the lab to be analyzed using method 8260. The equipment used to collect the sample was a hand auger. One sample was taken following the decontamination procedures listed in the CSAP and after the auger was let to dry. One soil sample was taken following the new EPA decontamination procedures set forward in their August 1996 audit. The audit stated that a smaller amount of DI water (using a squirt bottle filled with DI water to rinse off the alcohol instead of the larger amounts previously used) was to be used. One sample was also taken using a hand auger that was wrapped in tin foil and stored in the field trailer. As an added bonus, one water vial was spiked with a few drops of isopropyl alcohol. A trip blank was also submitted for analysis in case of any carryover contaminants.

The hand auger that was wrapped in foil had acetone detected at 10 ppb with no TICs reported. Using the August 1996 EPA audit decontamination procedures, acetone was detected at 200 ppb with TICs of isopropyl alcohol at 190 ppb. The concentration of isopropyl alcohol is estimated due to the fact that the laboratory is not required to establish instrument calibration criteria on TICs. Using the CSAP decontamination procedures, acetone was detected at 31 ppb with no tentatively identified compounds (TICs). The water spike showed acetone at 2900 and a TIC of isopropyl alcohol at 180000 ppb. The results of the water spike are estimated due to the sample having to be diluted in order for the instrument to properly quantify the results. The concentration of isopropyl alcohol is estimated due to the fact that the laboratory is not required to establish instrument calibration criteria on TICs.

It is apparent that sampling equipment needs to be rinsed heavily with DI water when required to use isopropyl alcohol as a decontamination step, and let it air dry as long as possible to help eliminate the possibility of cross contamination of unwanted acetone. It is not acceptable to have a bucket of DI water at the end of the decontamination line that is used all day without changing the water frequently. This happens far too many times. Isopropyl alcohol builds up and contributes to the cross contamination of samples with acetone.

For the data reviewer the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review state that acetone, methylene chloride and BEHP are common contaminants and certain rules such as the 10X rule need to be followed when evaluating blanks (lab or field) along with the samples. A caveat to this rule is when equipment and rinsate blanks are taken at the beginning of the day in ideal conditions and not after a full day of sampling, say when isopropyl alcohol has saturated the DI water bucket. This causes the reviewer to scrutinize data between blanks and samples that have not been collected by the same procedures.

As stated earlier, a base wide review of the data was performed on acetone, methylene chloride, and BEHP results to determine if there were trends developing that might shed some light on whether the results were site related or due to cross contamination. The quarterly groundwater monitoring program for all of the individual zones was evaluated in depth due to the concerns posed by the project team. All of the well data collected to date was printed out to see if analytical results showed repeated detections of acetone, methylene chloride, and BEHP. A comparison of soil data (soil borings and Direct Push Technology (DPT) in close proximity to monitoring wells was also made to see if possible leaching to groundwater could have occurred. When reviewing possible soil leaching of contaminants, the soil screening levels (SSL) along with history of the site, need to be considered before a final assessment of the data is made. The SSL for acetone is 8000 ppb ( $\mu\text{g}/\text{kg}$ ), methylene chloride is 10 ppb, and BEHP is 11,000 ppb.

The well ID 638001 from Zone G had acetone results that appeared in two of the groundwater monitoring rounds (3<sup>rd</sup> and 4<sup>th</sup>) at concentrations of 3 and 7 ppb. Three wells in Zone H show results that appear in multiple rounds. Well ID 009005 had results of acetone of 11.7 and 19 ppb in the 1<sup>st</sup> and 3<sup>rd</sup> respectively. Well ID 009009 had results of acetone of 22 and 4 ppb in the 2<sup>nd</sup> and 4<sup>th</sup> rounds and well ID 017005 had acetone results of 17.9 and 360 ppb in the 1<sup>st</sup> and 3<sup>rd</sup> rounds.

A review of the soil borings near the above mentioned wells showed that boring ID 638004, taken approximately 75 feet from the well, had a second interval acetone result of 120 ppb. Boring IDs GDHSB056 and GDHSB057 which were located approximately 175 ft. from well 009009 had detections of 27 and 17 ppb respectively. Boring ID 009SB005, taken where a well was constructed, did not have a detection for acetone.

A review of the acetone results for DPT samples in Zone A showed no correlation to the nearest well pair 03915 and 15D and the DPT samples taken in Zone F at AOC 607 did not have acetone detections. Four second round groundwater DPT samples were taken in Zone L because of first round detections of acetone in either soil and/or water DPT samples. Samples 037GP001, 037SP002, 037GP002, and 037GP003 in subzone F had detections of 65.8 ppb, 12.9 ppb, 5.63 ppb, and 7.03 ppb respectively. The second round samples for 037GP001 and 037GP003 did not have detections for acetone and sample 037GP002 had a result of 2 ppb.

Sample 037GP032 in subzone C had a first round detection of 683 ppb for acetone. The second round sample had a result of 15 ppb.

A review of the methylene chloride results showed well ID 009007 showing results of 130, 68, and 330 ppb in the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> rounds and well ID 017002 showing methylene chloride showing results of 520 and 240 ppb in the 2<sup>nd</sup> and 3<sup>rd</sup> rounds. The review of the soil borings collected around the vicinity of those wells showed no detections of methylene chloride. There was also no correlation between the DPT samples collected in Zones A and F and the wells that are in the vicinity of the DPT samples.

A review of the BEHP data shows that in Zone B well ID GDE009 had detections of 2 and 10 ppb for the 1<sup>st</sup> and 2<sup>nd</sup> rounds of data and well ID GDE09D had detections of 1 and 5 ppb for the 1<sup>st</sup> and 2<sup>nd</sup> rounds. The review of the soil borings for those wells showed non detects. Well ID 663002 in Zone H had detections of 180 and 59 ppb for the 3<sup>rd</sup> and 4<sup>th</sup> rounds and one soil boring, 663SB002 had a detection of 131 ppb of BEHP. Well ID 014003 had detections of 5 and 2 ppb for the 1<sup>st</sup> and 4<sup>th</sup> rounds. The site 684 soil borings taken around the well showed no detections for BEHP. Well ID 178001 had detections of 530 and 290 ppb in the 2<sup>nd</sup> and 3<sup>rd</sup> rounds. The site 178

borings taken around the well showed no detections for BEHP. Well ID GDH06D had BEHP detections of 3.9 and 230 ppb for the 1<sup>st</sup> and 2<sup>nd</sup> rounds. Soil boring GDHSB006 did not have detections of BEHP. Well ID GDH09D had detections of 6.9 and 2 ppb in the 2<sup>nd</sup> and 3<sup>rd</sup> rounds. The soil borings GDH076, GDH084 and GDH085 did not have detections of BEHP.

Heartland Environmental's task was to investigate the possible uses of methylene chloride at industrial and Department of Defense facilities and the possibility of acetone being a contaminant in isopropyl alcohol. Of particular interest is the information from Fisher Scientific Company that specifies isopropyl alcohol contains .002% (20ppm) of acetone. The type of isopropyl alcohol used at NAVBASE Charleston is the type Fisher's analytical reports discusses. Attachment B includes documentation from various USEPA resources as a supplement to this memo.

## **Findings regarding trace level methylene chloride and acetone contamination**

**Prepared for: Charlie Vernoy, EnSafe  
February 9, 1998**

Documentation concerning trace level methylene chloride and acetone contamination in a field investigation is very difficult to discover. Based on the review of many technical publications at several universities in St. Louis and extensive inquiries on the internet using five different databases for searches, Heartland ESI has not been able to discover evidence of prior papers concerning trace level contamination in the field. However, based on our extensive research, we have uncovered several documents which would support EnSafe's supposition that the concentrations of methylene chloride and acetone detected are field/laboratory contaminants.

Methylene chloride, CAS 75-09-2, is most widely used by companies that produce paint strippers, which have been determined to be a major contributor of hazardous waste generation in the Department of Defense. In addition, other companies use methylene chloride to clean metal surfaces. Thru the use of the strippers, it is plausible to ascertain that an uncertain amount of methylene chloride could randomly contaminate field samples without bias for quarterly monitoring. Methylene chloride is also categorized as a common laboratory contaminant that may be present in concentrations less than 25  $\mu\text{g/L}$  or  $\mu\text{g/Kg}$  without being outside the technical acceptance criteria. Therefore, based on the presence of methylene chloride at the site in question as a component of paint strippers and cleaners and the allowable presence of methylene chloride in "blank" samples, all trace levels of methylene chloride, ( $< 100$  ppb or  $< 10\text{X}$  methylene chloride CRQL) should be considered to be a field and/or laboratory contaminant.

The acetone, CAS 97-94-1, detected at the site can be attributed to the isopropanol utilized to decontaminate the sampling equipment. EnSafe used Fisher ACS grade isopropanol, which according to Ms. Deborah Hostetter, Senior Chemical Sales Specialist for Fisher Scientific, contains acetone as a contaminant. Deionized (DI) water rinses after the isopropanol decontamination is critical to insure that the isopropanol has been cleansed from the surface. After a field audit, EnSafe was instructed by the EPA to rinse the equipment with less DI water. If the equipment was not properly decontaminated with enough DI water to completely rid the equipment of isopropanol, traces of acetone would be present in field samples (as noted). Therefore, all trace acetone results ( $< 100$  ppb) can be attributed to the acetone contamination in the isopropanol.



**APPENDIX E**

Detections of Methylene Chloride in Zone E Blank Samples

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Sample ID  | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| 023EB00301 | EB          | 30-Aug-95      | 10            | =         | µg/L  |                        |                    |
| 067EB00301 | EB          | 07-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 573EB00201 | EB          | 11-Sep-95      | 8             | =         | µg/L  | 30 / 67                | 1 - 26 µg/L        |
| 097EB00301 | EB          | 18-Sep-95      | 5             | U         | µg/L  | 44.8%                  |                    |
| 100EB00101 | EB          | 27-Sep-95      | 5             | U         | µg/L  |                        | 30-Aug-95          |
| 551EB00301 | EB          | 03-Oct-95      | 3             | J         | µg/L  |                        | 12-Dec-96          |
| 023EB00202 | EB          | 16-Oct-95      | 9             | =         | µg/L  |                        |                    |
| 023E000101 | EB          | 17-Oct-95      | 5             | U         | µg/L  |                        |                    |
| 065EB00401 | EB          | 23-Oct-95      | 4             | J         | µg/L  |                        |                    |
| 596EB00502 | EB          | 23-Oct-95      | 5             | J         | µg/L  |                        |                    |
| 531EB00101 | EB          | 30-Oct-95      | 5             | =         | µg/L  |                        |                    |
| 559EB01001 | EB          | 07-Nov-95      | 5             | U         | µg/L  |                        |                    |
| 054EB00201 | EB          | 13-Nov-95      | 8             | =         | µg/L  |                        |                    |
| 559EB00402 | EB          | 13-Nov-95      | 9             | =         | µg/L  |                        |                    |
| 054EB00601 | EB          | 20-Nov-95      | 1             | J         | µg/L  |                        |                    |
| 054EB01401 | EB          | 27-Nov-95      | 11            | =         | µg/L  |                        |                    |
| 084EB00501 | EB          | 04-Dec-95      | 2             | J         | µg/L  |                        |                    |
| 065EW00101 | EB          | 07-Dec-95      | 5             | U         | µg/L  |                        |                    |
| GDEEW19D01 | EB          | 07-Dec-95      | 5             | U         | µg/L  |                        |                    |
| 083EB00202 | EB          | 18-Dec-95      | 5             | U         | µg/L  |                        |                    |
| 525EB00601 | EB          | 02-Jan-96      | 6             | J         | µg/L  |                        |                    |
| 590EB00501 | EB          | 08-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 550EB00601 | EB          | 16-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 570E000501 | EB          | 23-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 570EB00501 | EB          | 23-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 102EB00401 | EB          | 31-Jan-96      | 3             | J         | µg/L  |                        |                    |
| 025EB01001 | EB          | 06-Feb-96      | 5             | U         | µg/L  |                        |                    |
| 102E000101 | EB          | 06-Feb-96      | 5             | U         | µg/L  |                        |                    |
| 102EB01301 | EB          | 28-Feb-96      | 5             | U         | µg/L  |                        |                    |



**APPENDIX E**

Detections of Methylene Chloride in Zone E Blank Samples

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Sample ID  | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| 018EW00101 | EB          | 19-Mar-96      | 5             | U         | µg/L  |                        |                    |
| 583EW00101 | EB          | 25-Mar-96      | 5             | U         | µg/L  |                        |                    |
| 576EW00201 | EB          | 01-Apr-96      | 5             | U         | µg/L  |                        |                    |
| GDEEW01001 | EB          | 08-Apr-96      | 5             | U         | µg/L  |                        |                    |
| GDEEW02501 | EB          | 15-Apr-96      | 5             | U         | µg/L  |                        |                    |
| 526EW01D01 | EB          | 22-Apr-96      | 4             | J         | µg/L  |                        |                    |
| 539EW00101 | EB          | 29-Apr-96      | 26            | =         | µg/L  |                        |                    |
| 570EW02D01 | EB          | 06-May-96      | 5             | U         | µg/L  |                        |                    |
| 102EB04201 | EB          | 20-May-96      | 6             | =         | µg/L  |                        |                    |
| 559EB02301 | EB          | 28-May-96      | 2             | J         | µg/L  |                        |                    |
| 053EB00401 | EB          | 06-Jun-96      | 5             | U         | µg/L  |                        |                    |
| 596EW00302 | EB          | 08-Jul-96      | 5             | U         | µg/L  |                        |                    |
| 018EB00101 | EB          | 17-Jul-96      | 3             | J         | µg/L  |                        |                    |
| 145EW00102 | EB          | 18-Jul-96      | 2             | J         | µg/L  |                        |                    |
| 018EB00802 | EB          | 24-Jul-96      | 5             | U         | µg/L  |                        |                    |
| GDEEW14D02 | EB          | 25-Jul-96      | 12            | =         | µg/L  |                        |                    |
| 018ED00101 | EB          | 31-Jul-96      | 5             | U         | µg/L  |                        |                    |
| 018E000101 | EB          | 01-Aug-96      | 2             | J         | µg/L  |                        |                    |
| 018EB00601 | EB          | 01-Aug-96      | 5             | U         | µg/L  |                        |                    |
| 549EW00202 | EB          | 01-Aug-96      | 5             | U         | µg/L  |                        |                    |
| 054EW00102 | EB          | 09-Aug-96      | 13            | =         | µg/L  |                        |                    |
| 065EW00102 | EB          | 14-Aug-96      | 4             | J         | µg/L  |                        |                    |
| 065EB00701 | EB          | 10-Sep-96      | 5             | U         | µg/L  |                        |                    |
| GDEE002801 | EB          | 11-Sep-96      | 5             | U         | µg/L  |                        |                    |
| 620EB00501 | EB          | 16-Sep-96      | 1             | J         | µg/L  |                        |                    |
| FDSESC4702 | EB          | 24-Sep-96      | 14            | =         | µg/L  |                        |                    |
| FDSE009401 | EB          | 03-Oct-96      | 5             | U         | µg/L  |                        |                    |
| FDSESH2401 | EB          | 21-Oct-96      | 5             | U         | µg/L  |                        |                    |
| GDEEW02601 | EB          | 29-Oct-96      | 5             | U         | µg/L  |                        |                    |

# APPENDIX E

Detections of Methylene Chloride in Zone E Blank Samples

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Sample ID  | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| 596EW00403 | EB          | 31-Oct-96      | 7             | =         | µg/L  |                        |                    |
| 620EW00201 | EB          | 04-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDEEW01003 | EB          | 06-Nov-96      | 5             | U         | µg/L  |                        |                    |
| 084EW00103 | EB          | 15-Nov-96      | 2             | J         | µg/L  |                        |                    |
| GDEEW16D03 | EB          | 19-Nov-96      | 7             | =         | µg/L  |                        |                    |
| 551EW00103 | EB          | 26-Nov-96      | 5             | U         | µg/L  |                        |                    |
| 550EW00103 | EB          | 04-Dec-96      | 7             | =         | µg/L  |                        |                    |
| FDSE011401 | EB          | 05-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 063EW00103 | EB          | 12-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 5703000501 | FB          | 23-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 5707000501 | FB          | 23-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 1027000101 | FB          | 08-Feb-96      | 5             | U         | µg/L  | 14 / 30                | 1 - 30 µg/L        |
| 018FW00101 | FB          | 19-Mar-96      | 5             | U         | µg/L  | 46.7%                  |                    |
| 583FW00101 | FB          | 25-Mar-96      | 5             | U         | µg/L  |                        | 23-Jan-96          |
| 576FW00201 | FB          | 01-Apr-96      | 5             | U         | µg/L  |                        | 12-Dec-96          |
| GDEFW01301 | FB          | 09-Apr-96      | 5             | U         | µg/L  |                        |                    |
| GDEFW02501 | FB          | 15-Apr-96      | 5             | U         | µg/L  |                        |                    |
| 526FW01D01 | FB          | 22-Apr-96      | 3             | J         | µg/L  |                        |                    |
| 539FW00101 | FB          | 29-Apr-96      | 24            | =         | µg/L  |                        |                    |
| 570FW02D01 | FB          | 06-May-96      | 30            | =         | µg/L  |                        |                    |
| 596FW00302 | FB          | 08-Jul-96      | 1             | J         | µg/L  |                        |                    |
| 145FW00102 | FB          | 18-Jul-96      | 4             | J         | µg/L  |                        |                    |
| GDEFW14D02 | FB          | 25-Jul-96      | 11            | =         | µg/L  |                        |                    |
| 549FW00202 | FB          | 01-Aug-96      | 5             | U         | µg/L  |                        |                    |
| 054FW00102 | FB          | 09-Aug-96      | 5             | J         | µg/L  |                        |                    |
| 065FW00102 | FB          | 14-Aug-96      | 5             | J         | µg/L  |                        |                    |
| GDE7002801 | FB          | 11-Sep-96      | 5             | U         | µg/L  |                        |                    |
| 570P000401 | FB          | 12-Sep-96      | 5             | U         | µg/L  |                        |                    |
| GDEP026D01 | FB          | 13-Sep-96      | 12            | =         | µg/L  |                        |                    |

# APPENDIX E

Detections of Methylene Chloride in Zone E Blank Samples

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Sample ID  | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| FDSFSC4702 | FB          | 24-Sep-96      | 16            | =         | µg/L  |                        |                    |
| 018FW00501 | FB          | 01-Oct-96      | 5             | U         | µg/L  |                        |                    |
| 065FW00701 | FB          | 30-Oct-96      | 7             | =         | µg/L  |                        |                    |
| 596FW00403 | FB          | 31-Oct-96      | 9             | =         | µg/L  |                        |                    |
| GDEFW01003 | FB          | 06-Nov-96      | 5             | U         | µg/L  |                        |                    |
| 084FW00103 | FB          | 15-Nov-96      | 2             | J         | µg/L  |                        |                    |
| GDEFW16D03 | FB          | 19-Nov-96      | 8             | =         | µg/L  |                        |                    |
| 551FW00103 | FB          | 26-Nov-96      | 5             | U         | µg/L  |                        |                    |
| 550FW00103 | FB          | 04-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 063FW00103 | FB          | 12-Dec-96      | 5             | U         | µg/L  |                        |                    |
| FDS0E00101 | LB          | 20-Sep-96      | 12            | J         | µg/kg | 1 / 1 or 100%          | 12 µg/kg           |
| 538TB00802 | TB          | 28-Aug-95      | 11            | U         | µg/L  |                        |                    |
| 542TB00602 | TB          | 29-Aug-95      | 5             | U         | µg/L  |                        |                    |
| 063TB00201 | TB          | 30-Aug-95      | 5             | U         | µg/L  | 106 / 233              | 1 - 47 µg/L        |
| 543TB00402 | TB          | 30-Aug-95      | 5             | U         | µg/L  | 45.5%                  |                    |
| 070TB00301 | TB          | 31-Aug-95      | 5             | U         | µg/L  |                        | 28-Aug-95          |
| 549TB00301 | TB          | 31-Aug-95      | 5             | U         | µg/L  |                        | 13-Dec-96          |
| 548TB00102 | TB          | 01-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 548TB00201 | TB          | 05-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 576TB00501 | TB          | 06-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 022TB00202 | TB          | 07-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 172TB00401 | TB          | 08-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 566TB00301 | TB          | 09-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 572TB00501 | TB          | 10-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 573TB00201 | TB          | 11-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 579TB00402 | TB          | 12-Sep-95      | 5             | U         | µg/L  |                        |                    |
| GDETB00801 | TB          | 13-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 580TB00201 | TB          | 14-Sep-95      | 5             | U         | µg/L  |                        |                    |
| 583TB00601 | TB          | 15-Sep-95      | 5             | U         | µg/L  |                        |                    |

**APPENDIX E****Detections of Methylene Chloride in Zone E Blank Samples***RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex*

| <b>Sample ID</b> | <b>Sample Type</b> | <b>Date Collected</b> | <b>Concentration</b> | <b>Qualifier</b> | <b>Units</b> | <b>Frequency of Detection</b> | <b>Range of Detection</b> |
|------------------|--------------------|-----------------------|----------------------|------------------|--------------|-------------------------------|---------------------------|
| 097TB00301       | TB                 | 18-Sep-95             | 5                    | U                | µg/L         |                               |                           |
| 598TB00102       | TB                 | 19-Sep-95             | 5                    | U                | µg/L         |                               |                           |
| 603TB00202       | TB                 | 20-Sep-95             | 5                    | U                | µg/L         |                               |                           |
| 605TB00301       | TB                 | 21-Sep-95             | 12                   | =                | µg/L         |                               |                           |
| 605TB00901       | TB                 | 22-Sep-95             | 11                   | =                | µg/L         |                               |                           |
| 018TB00502       | TB                 | 25-Sep-95             | 5                    | U                | µg/L         |                               |                           |
| 605TB00201       | TB                 | 26-Sep-95             | 5                    | U                | µg/L         |                               |                           |
| 065TB00501       | TB                 | 27-Sep-95             | 5                    | U                | µg/L         |                               |                           |
| 544TB00102       | TB                 | 28-Sep-95             | 5                    | U                | µg/L         |                               |                           |
| 544TB00301       | TB                 | 29-Sep-95             | 8                    | =                | µg/L         |                               |                           |
| 551TB00301       | TB                 | 02-Oct-95             | 3                    | J                | µg/L         |                               |                           |
| 018TB00301a      | TB                 | 03-Oct-95             | 5                    | =                | µg/L         |                               |                           |
| 543TB00102       | TB                 | 11-Oct-95             | 10                   | =                | µg/L         |                               |                           |
| 528TB00202       | TB                 | 12-Oct-95             | 9                    | U                | µg/L         |                               |                           |
| 023TB00202       | TB                 | 13-Oct-95             | 5                    | U                | µg/L         |                               |                           |
| 586TB00302       | TB                 | 16-Oct-95             | 10                   | =                | µg/L         |                               |                           |
| 023T000101       | TB                 | 17-Oct-95             | 5                    | U                | µg/L         |                               |                           |
| 596TB00502       | TB                 | 20-Oct-95             | 5                    | U                | µg/L         |                               |                           |
| 596TB00401       | TB                 | 23-Oct-95             | 4                    | J                | µg/L         |                               |                           |
| GDETB02402       | TB                 | 25-Oct-95             | 27                   | =                | µg/L         |                               |                           |
| GDETB01801       | TB                 | 26-Oct-95             | 29                   | =                | µg/L         |                               |                           |
| 531TB00202       | TB                 | 27-Oct-95             | 28                   | =                | µg/L         |                               |                           |
| 596TB00901       | TB                 | 30-Oct-95             | 5                    | U                | µg/L         |                               |                           |
| 573TB00101       | TB                 | 31-Oct-95             | 25                   | U                | µg/L         |                               |                           |
| 556TB00101       | TB                 | 02-Nov-95             | 5                    | U                | µg/L         |                               |                           |
| 556TB00601       | TB                 | 03-Nov-95             | 27                   | =                | µg/L         |                               |                           |
| 559TB01301       | TB                 | 06-Nov-95             | 5                    | U                | µg/L         |                               |                           |
| 559TB01001       | TB                 | 07-Nov-95             | 5                    | U                | µg/L         |                               |                           |
| 556T000703       | TB                 | 08-Nov-95             | 5                    | U                | µg/L         |                               |                           |

**APPENDIX E**

Detections of Methylene Chloride in Zone E Blank Samples

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Sample ID   | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|-------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| 559TB00501  | TB          | 09-Nov-95      | 5             | U         | µg/L  |                        |                    |
| 559TB00402  | TB          | 10-Nov-95      | 5             | U         | µg/L  |                        |                    |
| 054TB00201  | TB          | 13-Nov-95      | 8             | =         | µg/L  |                        |                    |
| 559TB01102  | TB          | 14-Nov-95      | 9             | =         | µg/L  |                        |                    |
| 561TB00201  | TB          | 15-Nov-95      | 8             | =         | µg/L  |                        |                    |
| 526TB00402  | TB          | 16-Nov-95      | 5             | U         | µg/L  |                        |                    |
| 054TB00402  | TB          | 17-Nov-95      | 5             | U         | µg/L  |                        |                    |
| 054TB00601  | TB          | 20-Nov-95      | 2             | J         | µg/L  |                        |                    |
| 054TB01401a | TB          | 21-Nov-95      | 5             | U         | µg/L  |                        |                    |
| 054TB01401b | TB          | 27-Nov-95      | 8             | =         | µg/L  |                        |                    |
| 054TB03101  | TB          | 28-Nov-95      | 8             | =         | µg/L  |                        |                    |
| 084TB00101  | TB          | 29-Nov-95      | 2             | J         | µg/L  |                        |                    |
| 054TB03401  | TB          | 30-Nov-95      | 5             | U         | µg/L  |                        |                    |
| 084TB00601  | TB          | 01-Dec-95      | 1             | J         | µg/L  |                        |                    |
| 562TB00301  | TB          | 04-Dec-95      | 2             | J         | µg/L  |                        |                    |
| 562TB00201  | TB          | 05-Dec-95      | 1             | J         | µg/L  |                        |                    |
| GDETW19D01  | TB          | 07-Dec-95      | 5             | U         | µg/L  |                        |                    |
| 083TB00402  | TB          | 14-Dec-95      | 5             | U         | µg/L  |                        |                    |
| 083TB00502  | TB          | 18-Dec-95      | 5             | U         | µg/L  |                        |                    |
| 083TB00602  | TB          | 19-Dec-95      | 5             | U         | µg/L  |                        |                    |
| 525TB00601  | TB          | 02-Jan-96      | 6             | J         | µg/L  |                        |                    |
| 170TB00901  | TB          | 03-Jan-96      | 5             | J         | µg/L  |                        |                    |
| 590TB00101  | TB          | 04-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 590TB00501  | TB          | 05-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 602TB00301  | TB          | 08-Jan-96      | 5             | U         | µg/L  |                        |                    |
| 530TB00201  | TB          | 09-Jan-96      | 5             | U         | µg/L  |                        |                    |
| GDETB02301  | TB          | 10-Jan-96      | 47            | =         | µg/L  |                        |                    |
| 558TB00101  | TB          | 11-Jan-96      | 10            | =         | µg/L  |                        |                    |
| 570TB00501a | TB          | 16-Jan-96      | 5             | U         | µg/L  |                        |                    |

**APPENDIX E****Detections of Methylene Chloride in Zone E Blank Samples***RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex*

| <b>Sample ID</b> | <b>Sample Type</b> | <b>Date Collected</b> | <b>Concentration</b> | <b>Qualifier</b> | <b>Units</b> | <b>Frequency of Detection</b> | <b>Range of Detection</b> |
|------------------|--------------------|-----------------------|----------------------|------------------|--------------|-------------------------------|---------------------------|
| 570TB00501b      | TB                 | 23-Jan-96             | 5                    | U                | µg/L         |                               |                           |
| 563TB00501       | TB                 | 29-Jan-96             | 5                    | U                | µg/L         |                               |                           |
| 563TB00901       | TB                 | 30-Jan-96             | 3                    | J                | µg/L         |                               |                           |
| 102TB00401       | TB                 | 31-Jan-96             | 5                    | U                | µg/L         |                               |                           |
| 025TB00401       | TB                 | 01-Feb-96             | 3                    | J                | µg/L         |                               |                           |
| 025TB00601       | TB                 | 02-Feb-96             | 5                    | U                | µg/L         |                               |                           |
| 025TB01001       | TB                 | 05-Feb-96             | 5                    | U                | µg/L         |                               |                           |
| 102TB00101       | TB                 | 06-Feb-96             | 5                    | U                | µg/L         |                               |                           |
| 025TB01301       | TB                 | 08-Feb-96             | 5                    | U                | µg/L         |                               |                           |
| 102TB01301       | TB                 | 28-Feb-96             | 5                    | U                | µg/L         |                               |                           |
| 605TW00101       | TB                 | 19-Mar-96             | 5                    | U                | µg/L         |                               |                           |
| 598TW00101       | TB                 | 20-Mar-96             | 5                    | U                | µg/L         |                               |                           |
| 596TW00101       | TB                 | 21-Mar-96             | 5                    | U                | µg/L         |                               |                           |
| 596TW00301       | TB                 | 22-Mar-96             | 5                    | U                | µg/L         |                               |                           |
| GDETW00601       | TB                 | 25-Mar-96             | 33                   | =                | µg/L         |                               |                           |
| 583TW00301       | TB                 | 26-Mar-96             | 40                   | =                | µg/L         |                               |                           |
| 100TW00101       | TB                 | 27-Mar-96             | 8                    | =                | µg/L         |                               |                           |
| 563TW00101       | TB                 | 28-Mar-96             | 9                    | =                | µg/L         |                               |                           |
| GDETW01101       | TB                 | 01-Apr-96             | 5                    | U                | µg/L         |                               |                           |
| 172TW02D01       | TB                 | 02-Apr-96             | 5                    | U                | µg/L         |                               |                           |
| GDETW01201       | TB                 | 03-Apr-96             | 1                    | J                | µg/L         |                               |                           |
| 574TW00101       | TB                 | 04-Apr-96             | 5                    | U                | µg/L         |                               |                           |
| GDETW09D01       | TB                 | 05-Apr-96             | 2                    | J                | µg/L         |                               |                           |
| GDETW05D01       | TB                 | 08-Apr-96             | 5                    | U                | µg/L         |                               |                           |
| 551TW00101       | TB                 | 09-Apr-96             | 5                    | U                | µg/L         |                               |                           |
| GDETW04D01       | TB                 | 10-Apr-96             | 2                    | J                | µg/L         |                               |                           |
| 580TW00201       | TB                 | 11-Apr-96             | 1                    | J                | µg/L         |                               |                           |
| 054TW00101       | TB                 | 12-Apr-96             | 3                    | J                | µg/L         |                               |                           |
| GDETW25D01       | TB                 | 15-Apr-96             | 5                    | U                | µg/L         |                               |                           |

**APPENDIX E**

Detections of Methylene Chloride in Zone E Blank Samples

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Sample ID  | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| GDETW01901 | TB          | 16-Apr-96      | 5             | U         | µg/L  |                        |                    |
| 065TW00501 | TB          | 17-Apr-96      | 5             | U         | µg/L  |                        |                    |
| 063TW00101 | TB          | 19-Apr-96      | 2             | J         | µg/L  |                        |                    |
| 526TW01D01 | TB          | 22-Apr-96      | 4             | J         | µg/L  |                        |                    |
| GDETW02001 | TB          | 23-Apr-96      | 17            | J         | µg/L  |                        |                    |
| GDETW20D01 | TB          | 24-Apr-96      | 5             | U         | µg/L  |                        |                    |
| 549TW00201 | TB          | 25-Apr-96      | 18            | J         | µg/L  |                        |                    |
| 070TW00201 | TB          | 26-Apr-96      | 3             | J         | µg/L  |                        |                    |
| 538TW01D01 | TB          | 29-Apr-96      | 26            | =         | µg/L  |                        |                    |
| 530TW02D01 | TB          | 01-May-96      | 24            | =         | µg/L  |                        |                    |
| GDETW18D01 | TB          | 02-May-96      | 22            | =         | µg/L  |                        |                    |
| 559TW00101 | TB          | 03-May-96      | 3             | J         | µg/L  |                        |                    |
| 570TW02D01 | TB          | 06-May-96      | 5             | U         | µg/L  |                        |                    |
| 569TW00201 | TB          | 07-May-96      | 30            | =         | µg/L  |                        |                    |
| 559TW02D01 | TB          | 08-May-96      | 5             | J         | µg/L  |                        |                    |
| 559TW03D01 | TB          | 09-May-96      | 5             | =         | µg/L  |                        |                    |
| GDETW15D01 | TB          | 10-May-96      | 45            | =         | µg/L  |                        |                    |
| 578TB00602 | TB          | 16-May-96      | 5             | U         | µg/L  |                        |                    |
| 102TB04201 | TB          | 20-May-96      | 6             | =         | µg/L  |                        |                    |
| 084TB00802 | TB          | 24-May-96      | 5             | U         | µg/L  |                        |                    |
| 559TB02301 | TB          | 28-May-96      | 3             | J         | µg/L  |                        |                    |
| 559TB02902 | TB          | 29-May-96      | 5             | U         | µg/L  |                        |                    |
| 583TB00802 | TB          | 30-May-96      | 1             | J         | µg/L  |                        |                    |
| 605TB01502 | TB          | 31-May-96      | 5             | U         | µg/L  |                        |                    |
| 102TB03702 | TB          | 03-Jun-96      | 9             | U         | µg/L  |                        |                    |
| 561TB00602 | TB          | 04-Jun-96      | 4             | J         | µg/L  |                        |                    |
| 053TB00402 | TB          | 05-Jun-96      | 4             | J         | µg/L  |                        |                    |
| 053TB00401 | TB          | 06-Jun-96      | 5             | U         | µg/L  |                        |                    |
| GDETW00102 | TB          | 01-Jul-96      | 5             | U         | µg/L  |                        |                    |

**APPENDIX E****Detections of Methylene Chloride in Zone E Blank Samples***RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex*

| <b>Sample ID</b> | <b>Sample Type</b> | <b>Date Collected</b> | <b>Concentration</b> | <b>Qualifier</b> | <b>Units</b> | <b>Frequency of Detection</b> | <b>Range of Detection</b> |
|------------------|--------------------|-----------------------|----------------------|------------------|--------------|-------------------------------|---------------------------|
| GDETW00202       | TB                 | 02-Jul-96             | 1                    | J                | µg/L         |                               |                           |
| GDETW00302       | TB                 | 08-Jul-96             | 1                    | J                | µg/L         |                               |                           |
| GDETW00402       | TB                 | 09-Jul-96             | 1                    | J                | µg/L         |                               |                           |
| GDETW00502       | TB                 | 10-Jul-96             | 4                    | J                | µg/L         |                               |                           |
| 583TW00202       | TB                 | 16-Jul-96             | 9                    | =                | µg/L         |                               |                           |
| 018TB00101       | TB                 | 17-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| 583TW00302       | TB                 | 17-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| 018TB0011B       | TB                 | 18-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| 018TB00301b      | TB                 | 18-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| GDETW00702       | TB                 | 18-Jul-96             | 4                    | J                | µg/L         |                               |                           |
| 018TB01101       | TB                 | 19-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| 172TW02D02       | TB                 | 19-Jul-96             | 3                    | J                | µg/L         |                               |                           |
| 018TB01401       | TB                 | 22-Jul-96             | 2                    | J                | µg/L         |                               |                           |
| GDETW01002       | TB                 | 22-Jul-96             | 2                    | J                | µg/L         |                               |                           |
| 018TB00701       | TB                 | 23-Jul-96             | 2                    | J                | µg/L         |                               |                           |
| GDETW01302       | TB                 | 23-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| 018TB00801       | TB                 | 24-Jul-96             | 1                    | J                | µg/L         |                               |                           |
| GDETW12D02       | TB                 | 24-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| 018TG00401       | TB                 | 25-Jul-96             | 11                   | =                | µg/L         |                               |                           |
| 569TW00202       | TB                 | 25-Jul-96             | 1                    | J                | µg/L         |                               |                           |
| 018TG01001       | TB                 | 26-Jul-96             | 1                    | J                | µg/L         |                               |                           |
| 559TW02D02       | TB                 | 26-Jul-96             | 1                    | J                | µg/L         |                               |                           |
| 018TG00201       | TB                 | 29-Jul-96             | 27                   | =                | µg/L         |                               |                           |
| 559TW03D02       | TB                 | 29-Jul-96             | 19                   | =                | µg/L         |                               |                           |
| 018T000101       | TB                 | 30-Jul-96             | 2                    | J                | µg/L         |                               |                           |
| GDETW16D02       | TB                 | 30-Jul-96             | 2                    | J                | µg/L         |                               |                           |
| 018TD00101       | TB                 | 31-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| GDETW19D02       | TB                 | 31-Jul-96             | 5                    | U                | µg/L         |                               |                           |
| 018TB00601       | TB                 | 01-Aug-96             | 1                    | J                | µg/L         |                               |                           |



**APPENDIX E**

Detections of Methylene Chloride in Zone E Blank Samples

*RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex*

| Sample ID   | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|-------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| 549TW00102  | TB          | 01-Aug-96      | 10            | =         | µg/L  |                        |                    |
| GDETW02202  | TB          | 02-Aug-96      | 2             | J         | µg/L  |                        |                    |
| 542TW00302  | TB          | 05-Aug-96      | 5             | J         | µg/L  |                        |                    |
| GDETW02502  | TB          | 06-Aug-96      | 14            | =         | µg/L  |                        |                    |
| GDETW25D02  | TB          | 07-Aug-96      | 14            | =         | µg/L  |                        |                    |
| 054TW00202  | TB          | 08-Aug-96      | 7             | =         | µg/L  |                        |                    |
| 530TW02D02  | TB          | 09-Aug-96      | 14            | =         | µg/L  |                        |                    |
| 018TD00601  | TB          | 13-Aug-96      | 8             | =         | µg/L  |                        |                    |
| 065TW00202  | TB          | 13-Aug-96      | 4             | J         | µg/L  |                        |                    |
| 065TW00102  | TB          | 14-Aug-96      | 8             | =         | µg/L  |                        |                    |
| 065TW00402  | TB          | 15-Aug-96      | 5             | =         | µg/L  |                        |                    |
| 018TD00701a | TB          | 20-Aug-96      | 7             | =         | µg/L  |                        |                    |
| 620TB00401  | TB          | 10-Sep-96      | 5             | U         | µg/L  |                        |                    |
| GDET002601  | TB          | 10-Sep-96      | 5             | U         | µg/L  |                        |                    |
| GDET002801  | TB          | 11-Sep-96      | 5             | U         | µg/L  |                        |                    |
| 570T000401  | TB          | 12-Sep-96      | 5             | U         | µg/L  |                        |                    |
| GDET026D01  | TB          | 13-Sep-96      | 8             | =         | µg/L  |                        |                    |
| 590TB00601  | TB          | 16-Sep-96      | 9             | =         | µg/L  |                        |                    |
| 620TB00501  | TB          | 16-Sep-96      | 5             | U         | µg/L  |                        |                    |
| FDSTB00101  | TB          | 20-Sep-96      | 5             | U         | µg/L  |                        |                    |
| FDSTC05801  | TB          | 24-Sep-96      | 16            | =         | µg/L  |                        |                    |
| FDSTC06701  | TB          | 25-Sep-96      | 13            | =         | µg/L  |                        |                    |
| 018TW0061A  | TB          | 26-Sep-96      | 12            | =         | µg/L  |                        |                    |
| 528T000101  | TB          | 26-Sep-96      | 5             | U         | µg/kg |                        |                    |
| 018TW00401  | TB          | 27-Sep-96      | 5             | U         | µg/L  |                        |                    |
| 018TW00101  | TB          | 30-Sep-96      | 4             | J         | µg/L  |                        |                    |
| 018TD00701b | TB          | 01-Oct-96      | 5             | U         | µg/kg |                        |                    |
| 018TW00601  | TB          | 01-Oct-96      | 1             | J         | µg/L  |                        |                    |
| FDSTC08401  | TB          | 02-Oct-96      | 5             | U         | µg/kg |                        |                    |

**APPENDIX E**

Detections of Methylene Chloride in Zone E Blank Samples

RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex

| Sample ID  | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| FDSTC09401 | TB          | 04-Oct-96      | 5             | U         | µg/L  |                        |                    |
| FDSTH02301 | TB          | 17-Oct-96      | 5             | U         | µg/kg |                        |                    |
| FDSTB02601 | TB          | 21-Oct-96      | 6             | U         | µg/kg |                        |                    |
| FDSTSH2401 | TB          | 21-Oct-96      | 5             | U         | µg/L  |                        |                    |
| GDETW00203 | TB          | 28-Oct-96      | 5             | U         | µg/L  |                        |                    |
| GDETW01D03 | TB          | 29-Oct-96      | 5             | U         | µg/L  |                        |                    |
| GDETW02601 | TB          | 29-Oct-96      | 6             | =         | µg/L  |                        |                    |
| 065TW00701 | TB          | 30-Oct-96      | 8             | =         | µg/L  |                        |                    |
| GDETW04D03 | TB          | 30-Oct-96      | 7             | =         | µg/L  |                        |                    |
| GDETW00603 | TB          | 31-Oct-96      | 5             | =         | µg/L  |                        |                    |
| GDETW30D01 | TB          | 31-Oct-96      | 8             | =         | µg/L  |                        |                    |
| 570TW00401 | TB          | 01-Nov-96      | 32            | =         | µg/L  |                        |                    |
| GDETW00303 | TB          | 01-Nov-96      | 7             | =         | µg/L  |                        |                    |
| 620TW00201 | TB          | 04-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW07D03 | TB          | 04-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW00803 | TB          | 05-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW01003 | TB          | 06-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW01103 | TB          | 07-Nov-96      | 5             | U         | µg/L  |                        |                    |
| 620TW00101 | TB          | 08-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW01303 | TB          | 12-Nov-96      | 2             | J         | µg/L  |                        |                    |
| GDETW01503 | TB          | 13-Nov-96      | 2             | J         | µg/L  |                        |                    |
| GDETW15D03 | TB          | 14-Nov-96      | 2             | J         | µg/L  |                        |                    |
| GDETW18D03 | TB          | 15-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW01703 | TB          | 18-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW19D03 | TB          | 19-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW21D03 | TB          | 20-Nov-96      | 5             | U         | µg/L  |                        |                    |
| 569TW00203 | TB          | 21-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW23D03 | TB          | 22-Nov-96      | 5             | U         | µg/L  |                        |                    |
| 559TW03D03 | TB          | 25-Nov-96      | 5             | U         | µg/L  |                        |                    |

**APPENDIX E****Detections of Methylene Chloride in Zone E Blank Samples***RFI Report Addendum, AOC 583, Zone E, Charleston Naval Complex*

| Sample ID  | Sample Type | Date Collected | Concentration | Qualifier | Units | Frequency of Detection | Range of Detection |
|------------|-------------|----------------|---------------|-----------|-------|------------------------|--------------------|
| 551TW00103 | TB          | 26-Nov-96      | 5             | U         | µg/L  |                        |                    |
| GDETW02403 | TB          | 02-Dec-96      | 23            | =         | µg/L  |                        |                    |
| GDETW00503 | TB          | 03-Dec-96      | 18            | =         | µg/L  |                        |                    |
| 550TW00103 | TB          | 04-Dec-96      | 5             | U         | µg/L  |                        |                    |
| FDST011401 | TB          | 05-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 559TW02D03 | TB          | 06-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 065TW00403 | TB          | 09-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 530TW01D03 | TB          | 10-Dec-96      | 5             | U         | µg/L  |                        |                    |
| FDSTC06201 | TB          | 10-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 065TW00103 | TB          | 11-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 065TW00603 | TB          | 12-Dec-96      | 5             | U         | µg/L  |                        |                    |
| 539TW00103 | TB          | 13-Dec-96      | 5             | U         | µg/L  |                        |                    |

= indicates that the compound was detected, the reported concentration is the measured concentration.

U indicates that the compound was not detected, the reported concentration is the detection limit.

J indicates that the compound was detected, the reported concentration is an estimated concentration.

EB Equipment blank

FB Field blank

LB Laboratory blank

TB Trip blank

µg/kg Microgram per kilogram

µg/L Microgram per liter